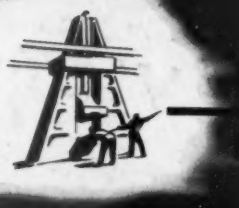
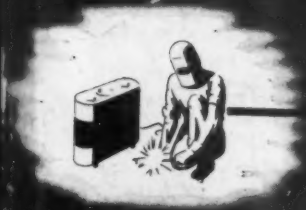
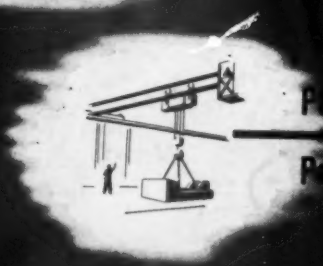
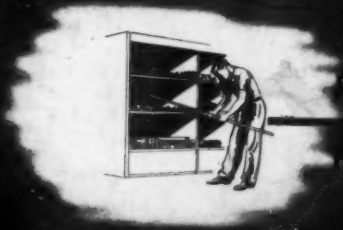


American Machinist

31st annual review number







In 1944

LET'S WORK FOR VICTORY

Only reconversion planning NOW can avert the widespread unemployment otherwise inevitable in the period between cessation of war production and resumption of peacetime production. Not that we have won the war, we haven't, and a long, desperate battle lies ahead. Even so, every bit of postwar planning done now will help in far greater ratio, when V-Day comes, to provide for the stricken people of a ravaged world, in putting our demobilized soldiers and war workers back to work on useful jobs.

If your postwar plans include precision finishing, HEALD ENGINEERING is available, now. Long and varied experience in solving countless problems in precision boring and grinding in consumer and heavy industries, plus our undiminished present efforts in war production, can be immensely helpful. We'll be glad to work with you.

THE HEALD MACHINE CO., Worcester, Mass.

But Plan For Peace

In 194V the most tremendous shortage of goods this world has ever known must be satisfied — by you and your competitors. Planning now for postwar production will eliminate many bottlenecks later — and if problems involve precision Heald will gladly cooperate in their solution. Although our staff of 250 engineers are engaged on war problems, their experience in finishing peacetime products from automobiles to sewing machines is also available to help in your postwar planning.

In 1944 A

for More Precision Faster, bring your problem to Heald

American Machinist

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31st ANNUAL REVIEW NUMBER

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From _____

_____

To _____

_____

Signed _____

IMPORTANT ANNOUNCEMENT!

Concerning

AMERICAN MACHINIST'S ANNUAL

WHERE-TO-BUY DIRECTORY

For years a feature of our Annual Review Number has been the "Where-to-Buy Directory"—a section listing leading manufacturers of Metal-Working equipment, tools, accessories, materials and supplies. Thousands of readers have told us of the invaluable help this Directory provides as a year 'round buying guide.

You will notice that this 1944 issue does *not* include the "Where-to-Buy" listing. We had to omit it in order to save paper. As you may know, publishers of magazines are having to struggle with an additional 15% paper cut this year and have been forced to cut corners wherever possible.

We are, however, printing the "Where-to-Buy Directory" as a separate booklet. These are available upon request at no charge.

Every effort has been made to revise the Directory carefully and provide you with an accurate listing of Metal-Working suppliers. We feel we have an obligation to continue this service to our readers—particularly in view of the great demand for authentic information which 1944 seems likely to produce.

We want every reader who uses this service to have a copy of the new *American Machinist* "Where-to-Buy Directory." Purchasing departments and government officials, too, are invited to take advantage of this free offer. Merely fill out and mail the coupon below, and we'll see that a copy of the 1944 Directory is sent you promptly.

AMERICAN MACHINIST
330 West 42d St., New York 18, N.Y.

Please send me at no charge a copy of the 1944 "Where-to-Buy Directory."

NAME .....

POSITION .....

FIRM .....

ADDRESS .....

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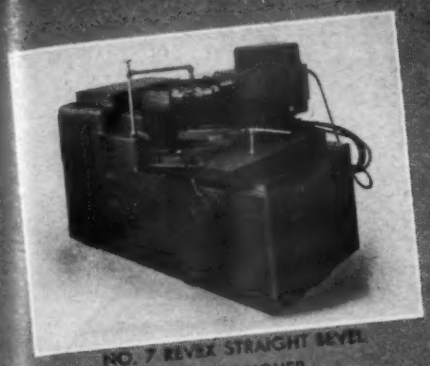
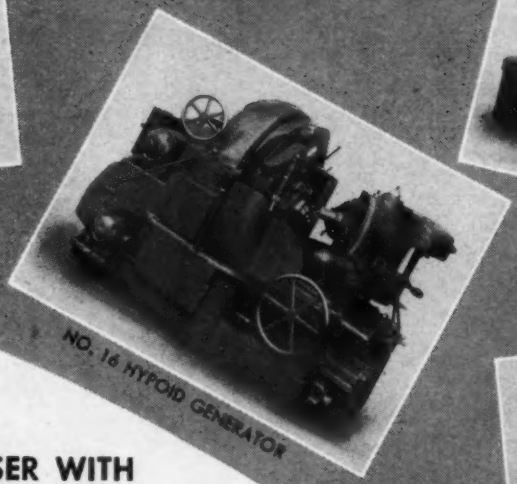
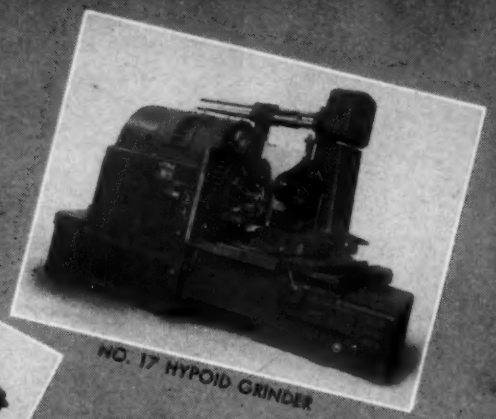
FILL OUT COUPON AND MAIL FOR YOUR *FREE COPY*



NO. 7 REVEX STRAIGHT BEVEL GEAR ROUGHER



NO. 16 HYPOID GENERATOR



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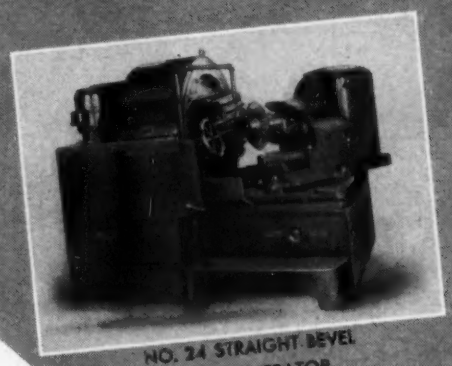


NO. 24 STRAIGHT BEVEL GEAR GENERATOR

IN 1944

BRINGING VICTORY CLOSER WITH FAST, ACCURATE PRODUCTION ON

GLEASONS

BEVEL GEARS

Bevel gears are providing smooth, high speed power transmission for many of the engines of war, such as airplanes, "PT" boats, tanks, "jeeps." In addition, bombsights, radar units, anti-aircraft gun directors and other instruments of war depend on bevel gears for their accuracy. These vital gears are cut on Gleason machines with the ultimate in precision and speed of output.

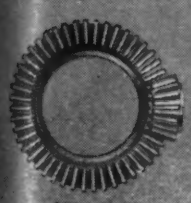
GLEASON MACHINES

The machines shown here are just a representative few of the Gleason line of complete equipment for manufacturing straight, spiral, Zerol bevel and hypoid gears from 3/16″ to 192″ diameter and for every type of application.

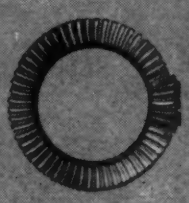
Over 50 current models are available -- bevel gear roughers, finishers, generators, grinders, planers, testers, tool and cutter sharpeners, quenching presses and surface hardening machines. Whether universal, jobbing - type or single - purpose, mass - production equipment is required, there is a machine to fit every production set-up.

SPIRAL

HYPOID



STRAIGHT



ZEROL

BEVEL GEARS

Although these machines are now producing all out for war, after victory is won, Gleason products will again cut bevel gears for automobiles, tractors, washing machines and other articles needed to bring a higher standard of living to a world at peace.

GLEASON WORKS

Builders of Bevel Gear Machinery for Over Seventy-five Years

1000 UNIVERSITY AVENUE, ROCHESTER 3, N. Y., U. S. A.

CINCINNATI

THE I-18 PACKS THE

Navy E awarded March 6, 1942. Renewal star awarded August 29, 1942, along with Army-Navy E. The second star was awarded February 23, 1943, and the third star September 27, 1943.

THE CINCINNATI MI

MILLING MACHINES

Although the CINCINNATI No. 1-18 Miller is powered by a small motor (3 h.p.), it is capable of taking a healthy cut, as the illustration shows. On this job the end mill used is 1-15/16″ O.D. at the large end, 55 degree angle, 7/16″ radius at point. Depth of cut 1-3/8″; width of cut at top 1-7/8″; spindle speed 380 rpm; table feed 3/4″ per minute. Quite a job of removing metal, but the 1-18 Automatic is equal to it because of its sturdy knee and table construction (no saddle); anti-friction spindle drive with only four gear contacts; large diameter quill for spindle with convenient and effective quill clamp. Then, too, the close coupled set-up is smart shop practice. ¶ Combining these elements assures maximum rigidity for taking heavy cuts. The automatic table cycle, with 300″ per minute power rapid traverse, takes care of the production factor in jobs of this type. ¶ The CINCINNATI 1-18 is a mighty useful miller to have in your shop, and we know it will be to your advantage to investigate this machine for your present or future requirements. Our engineers will be glad to discuss this with you, or on request will send catalog M-848 which gives complete details.

Milling a rock bit on a CINCINNATI No. 1-18 Plain Automatic Miller.

WALLOP OF A HEAVYWEIGHT

The CINCINNATI No. 1-18 Plain Automatic Milling Machine. Complete details may be obtained by writing for catalog M-848. Or for a brief description, look in Sweet's Catalog File for Mechanical Industries.

TI MILLING MACHINE CO. CINCINNATI 9, OHIO, U. S. A.

INES

BROACHING MACHINES • CUTTER SHARPENING MACHINES

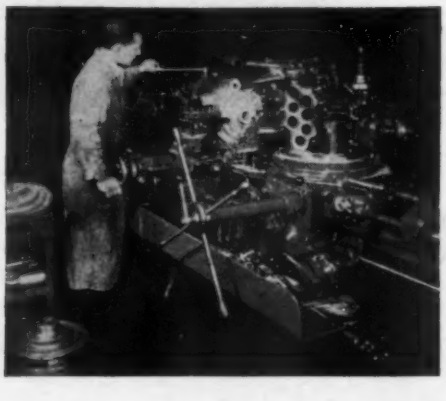
MIDSUMMER DAY'S DREAM

For centuries sweating men have talked of doing something about summer weather and have dreamed of ideas for tempering its discomforts. In the early eighteen hundreds George Cruikshank, master of ridicule, took this satirical swing at the "air-conditioning" dreams of his contemporaries.

Today air conditioning is an accomplished fact. And manufacturers plan that, after the war is won, every American homeowner may be independent of climate, wherever he lives.

All progressive manufacturers are planning, but, unlike the picture making dreamers of other days, modern manufacturers can get *their* dreams into production. For today a modern machine tool industry is working with them, planning the tools that will get inventions and designs into the homes of American people . . . quickly and economically.

Jones & Lamson engineers are at your service, as they have been for more than a century, to help you turn today's plans into tomorrow's realities.



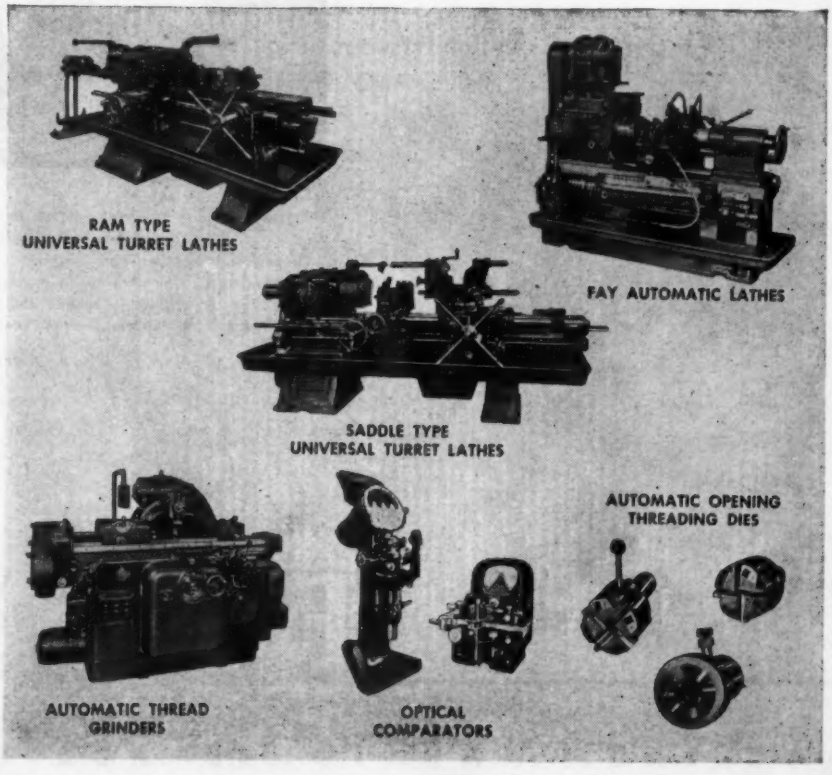
The versatility of Jones & Lamson Universal Turret Lathes and their high precision and high production are vital to America's industries—they will be of great economic advantage to all metal working manufacturers in the competition of tomorrow.

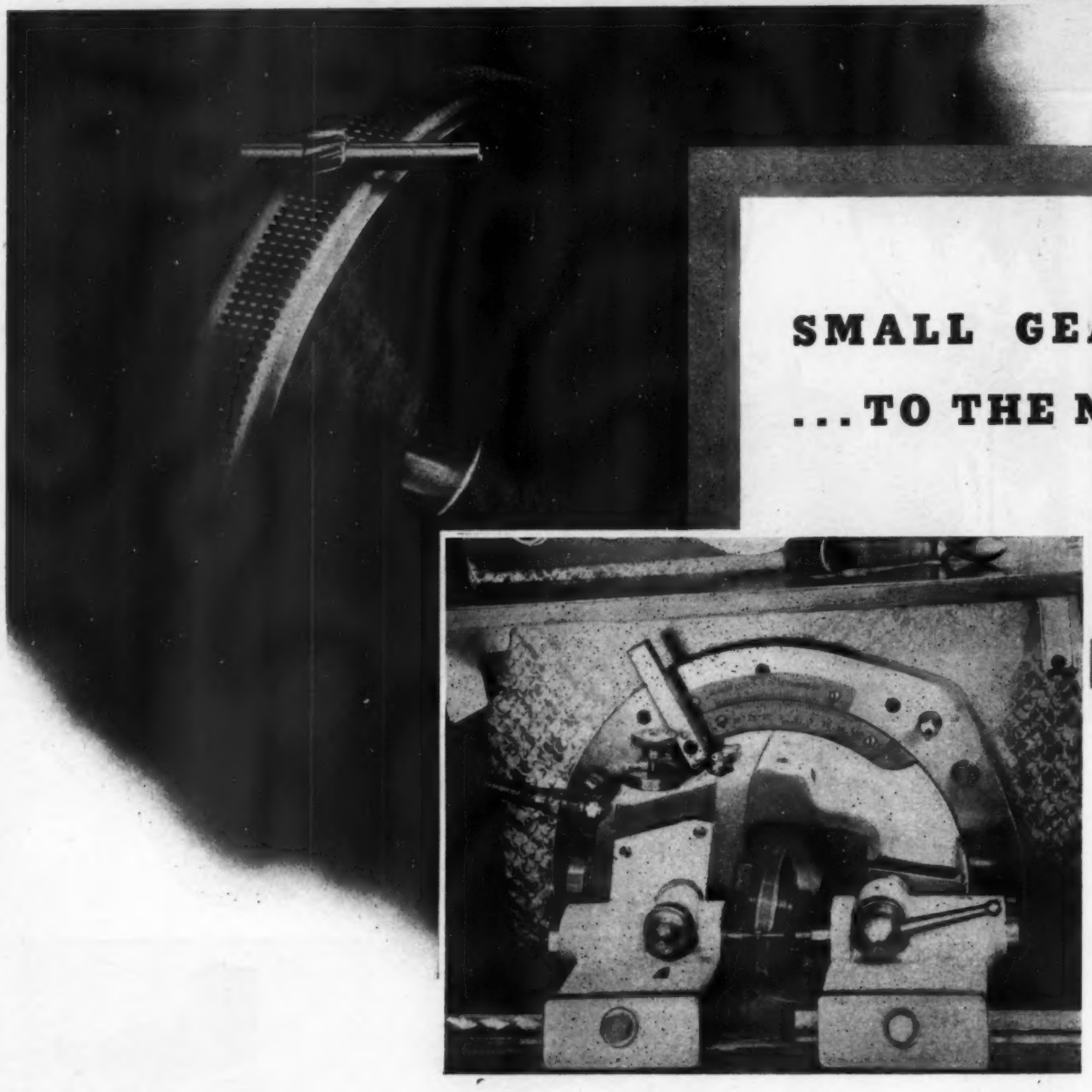
THE BETTMANN ARCHIVE

JONES & LAMSON
MACHINE COMPANY
SPRINGFIELD, VERMONT, U. S. A.

Manufacturers of: Universal Turret Lathes • Fay Automatic Lathes • Automatic Double-End Milling and Centering Machines • Automatic Thread Grinders • Optical Comparators • Automatic Opening Threading Dies and Chasers.

PROFIT-PRODUCING MACHINE TOOLS





SMALL GEAR ...TO THE Nth DEG

Illustrated here is the work-holding and shaving tool operating mechanism of the Fellows No. 4 Fine-Pitch Gear Shaving Machine, shown finishing a 60 N. P. helical pinion 3/16 inch outside diameter. This machine is able to turn out small precision gears at a high production rate. The shaving operation removes chips of almost microscopic fineness, producing teeth accurately — shaped and concentric. High, accurate production is a function of this machine and Fellows Shaving Tools, and is not dependent on the skill of the operator.

FELLOWS

MACHINES AND TOOLS FOR GEAR PRODUCTIO

PRECISION

th EGREE ... AND ON A PRODUCTION BASIS

Zero blacklash gears, if specifications insist, can be duplicated in quantity and at exceedingly low cost . . . on the new Fellows Fine-Pitch Gear Shaving Machine.

This Fellows Gear Shaving Method employs a serrated tool, which is brought into intimate contact with the work under pressure and rotates the latter. At the same time the work is slowly traversed across the face of the tool.

Shaving removes stock in *tenths of a thousandth* and produces involute teeth of super-accuracy, and of the finest surface finish. To obtain maximum cost-economy, gears should be precision cut prior to the shaving operation.

Manufacturers requiring external spur or helical gears and pinions, from 1/8 to 4 inches pitch diameter and of from 24 to 100 diametral pitch will find the FELLOWS No. 4 FINE-PITCH GEAR SHAVING MACHINE a sound production investment. It finishes small gears in quantity, and at exceedingly low cost.

For further details, ask us to send descriptive circular. Write: The Fellows Gear Shaper Company, Springfield, Vermont — or 616 Fisher Building, Detroit 2, Michigan, or 640 West Town Office Building, Chicago 12, Illinois.

Method

. . . . FROM BLANK TO FINISHED GEAR

The above illustration further demonstrates the possibility of using a standard machine, with minor extra equipment, for a special grinding job. Here two diameters are ground at the same time by the infeed method. Special elements consist of two grinding wheels separated by a thin spacer, a special footstock truing device and a special dog to trip the table traverse when truing the small diameter wheel. Everything else on the machine is standard. There were two different size parts on the job, the same set-up being used for grinding both sizes. When the need for this particular set-up no longer exists, the machine may be used for regular work. This is one of the big advantages of CINCINNATI 10″ Plain Hydraulic Grinding Machines, and a feature worthy of your serious consideration. ¶ The engineers here at Grinding Headquarters will be glad to tell you how the CINCINNATI 10″ Plain Hydraulic Grinder may be applied to your centertype work. Sweet's Catalog File for Mechanical Industries gives a brief description of this machine. Complete details and specifications may be had by writing for catalog G-490-1. Send for your copy today.

Navy E awarded March 6, 1942. Renewal star awarded August 29, 1942, along with Army-Navy E. The second star was awarded February 23, 1943, and the third star September 27, 1943.

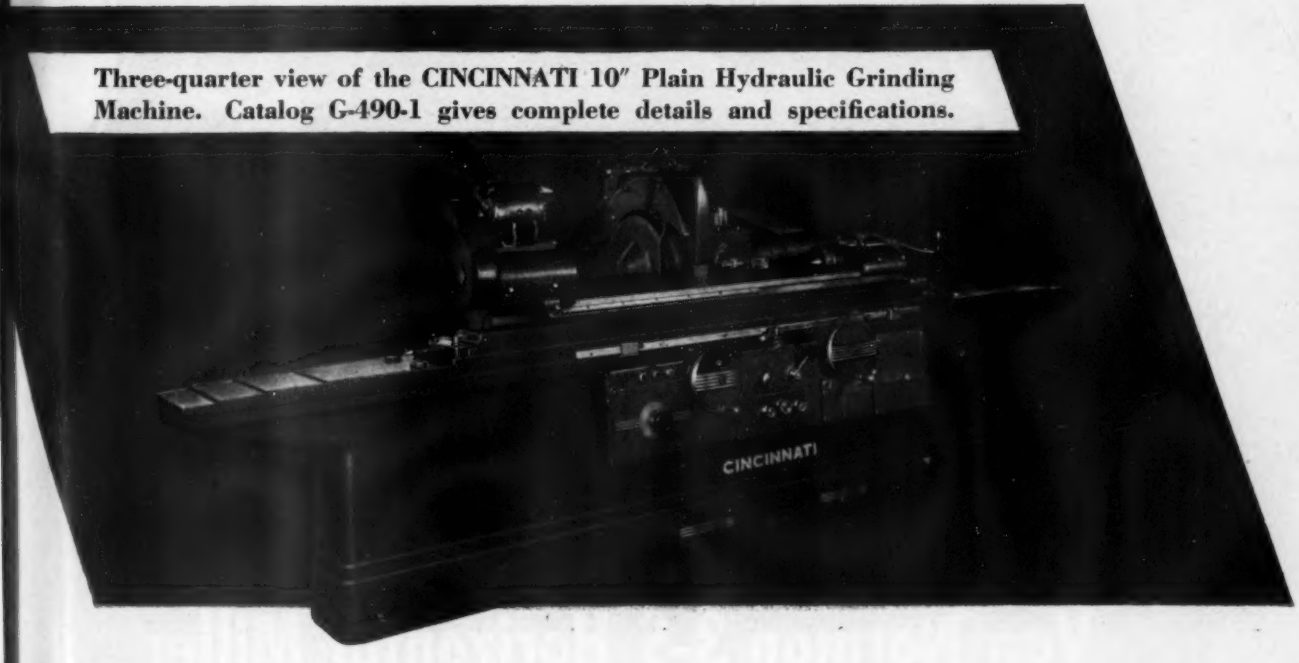
CINCINNATI GR

CINCINN

CENTER TYPE GRINDING MACHINE ENTERL

Another two-wheel job!

. . . centertype grinding two diameters at the same time

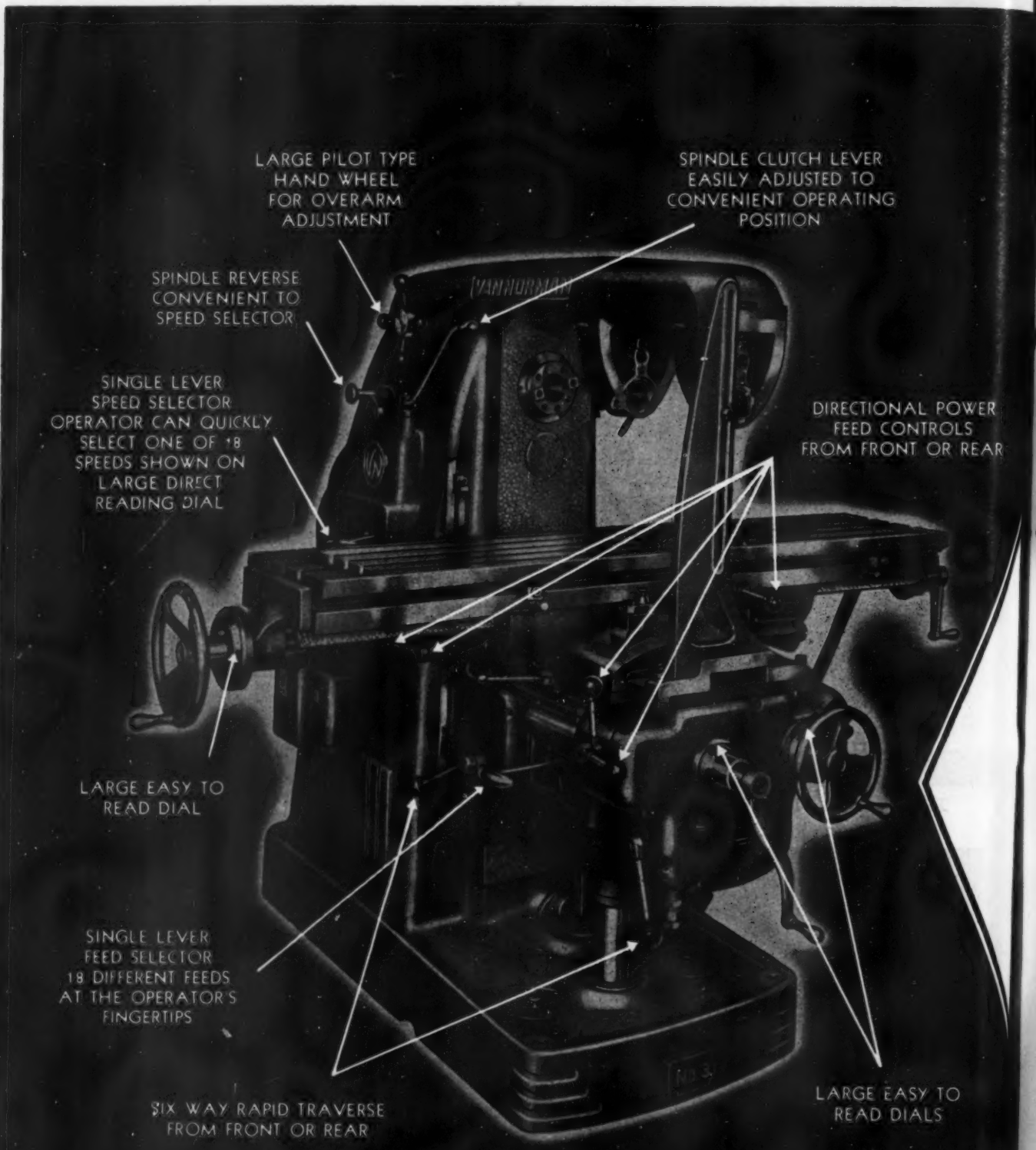


Three-quarter view of the CINCINNATI 10″ Plain Hydraulic Grinding Machine. Catalog G-490-1 gives complete details and specifications.

GRINDERS INCORPORATED

CINCINNATI 9, OHIO, U. S. A.

CENTERLESS GRINDING MACHINES • CENTERLESS LAPPING MACHINES


LARGE PILOT TYPE HAND WHEEL FOR OVERARM ADJUSTMENT
SPINDLE CLUTCH LEVER EASILY ADJUSTED TO CONVENIENT OPERATING POSITION
SPINDLE REVERSE CONVENIENT TO SPEED SELECTOR
SINGLE LEVER SPEED SELECTOR OPERATOR CAN QUICKLY SELECT ONE OF 18 SPEEDS SHOWN ON LARGE DIRECT READING DIAL
DIRECTIONAL POWER FEED CONTROLS FROM FRONT OR REAR
LARGE EASY TO READ DIAL
SINGLE LEVER FEED SELECTOR 18 DIFFERENT FEEDS AT THE OPERATOR'S FINGERTIPS
SIX WAY RAPID TRAVERSE FROM FRONT OR REAR
LARGE EASY TO READ DIALS

Van Norman 3-S Horizontal Miller

VAN NORMAN COMPANY, SPRINGFIELD 7, MASSACHUSETTS

Every Feature Points to

Greater Operating Convenience

..on Van Norman's 3-S Horizontal Miller

From either front or rear of this machine, the operator has complete directional control of power feeds right at his finger tips . . . also of the 6-way rapid traverse, by means of levers both on front and rear of knee. Spindle-clutch lever, too can be adjusted for operation from either side. 18 speed changes, from 25 to 1250 rpm, are instantly selected by a single lever . . . as are the 18 feed changes. Finally, accurate reading of dials is facilitated by their extra-large size, their plainly marked graduations, and their buffed chrome finish which prevents glare. In every feature, No. 3-S is designed for highest accuracy and output on horizontal work.

VAN NORMAN COMPANY
SPRINGFIELD 7, MASS.

VAN NORMAN
Milling Machines

PROVEN FOR OVER 40 YEARS

The Landis Line is the result of over 40 years of engineering research, experiment, trial and knowledge gained from actual performance of Landis Products in your plants.

We offer you—again in 1944—the world's Finest Threading Equipment—tested and proven under all conditions in thousands of plants all over the globe.

THE LANDMATIC HEAD

LANDIS LT COLLAPSIBLE TAP

THE LANCO HEAD

The LANDIS Chaser

The finest Thread Cutting Tool in Industry

LANDIS [illegible] THREADING MACHINE

LANDIS

THREADING MACHINERY • THREAD CUTTING DIE HEADS

LANDIS
REG U.S. TRADE—MARK

The LANDIS LINE

THREAD CUTTING MACHINES
- Landmaco Threading Machines
- Bolt Factory Threaders
- Automatic Forming and Threading Machines
- 4 Spindle Semi-Automatic Threading Machines
- Pipe and Nipple Threading Machines

THREAD CUTTING DIE HEADS
- Landmatic (for Turret Lathes and Screw Machines)
- Landex (for Automatic Screw Machines)
- Lanco (for Automatic, Semi-Automatic and Hand-Operated Threading Machines)
- Lanco Pipe and Nipple Threading Heads
- Stationary Pipe Die Heads
- Reverse Taper Die Heads
- Standard Rotary Die Heads

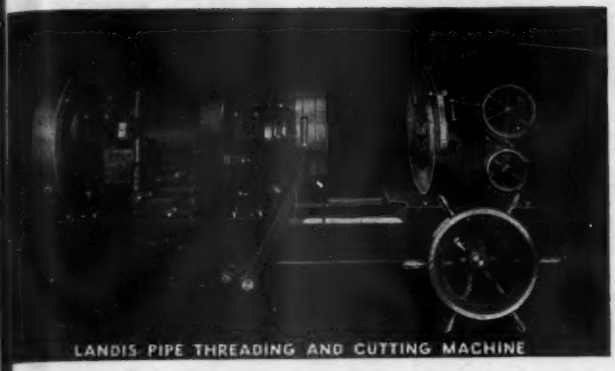
PRECISION THREAD GRINDERS

PIPE THREADING AND CUTTING MACHINES

ROLLER PIPE CUTTERS

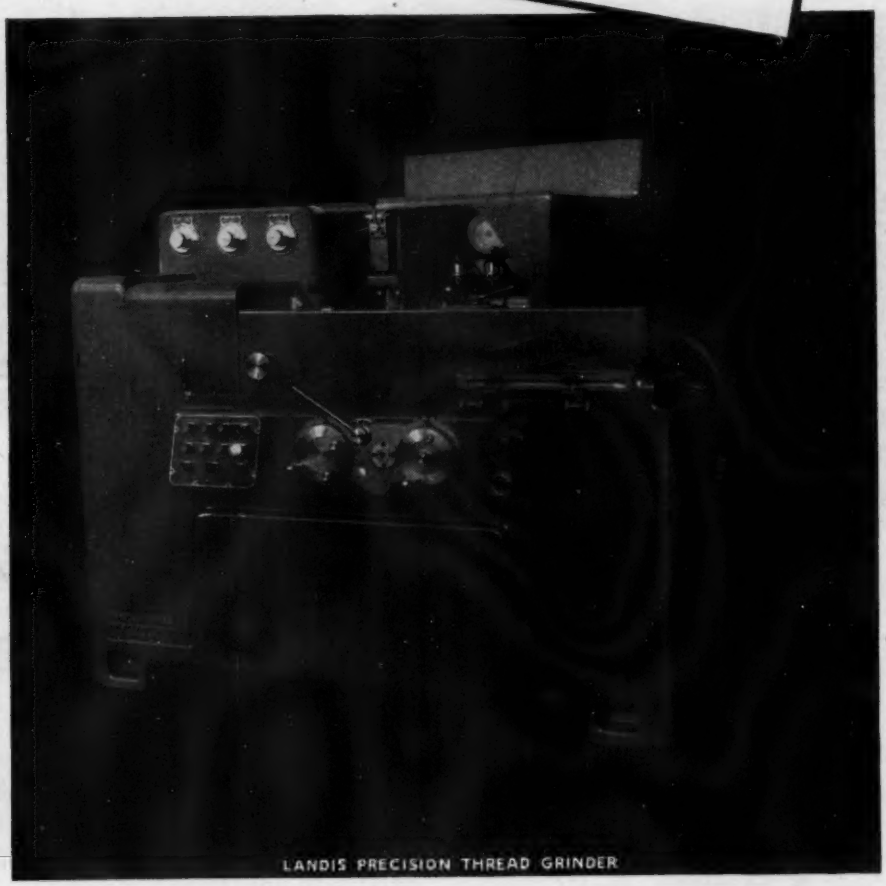
CHASER GRINDERS

COLLAPSIBLE AND ADJUSTABLE TAPS



LANDIS PIPE THREADING AND CUTTING MACHINE

AUTOMATIC FORMING & THREADING MACHINE

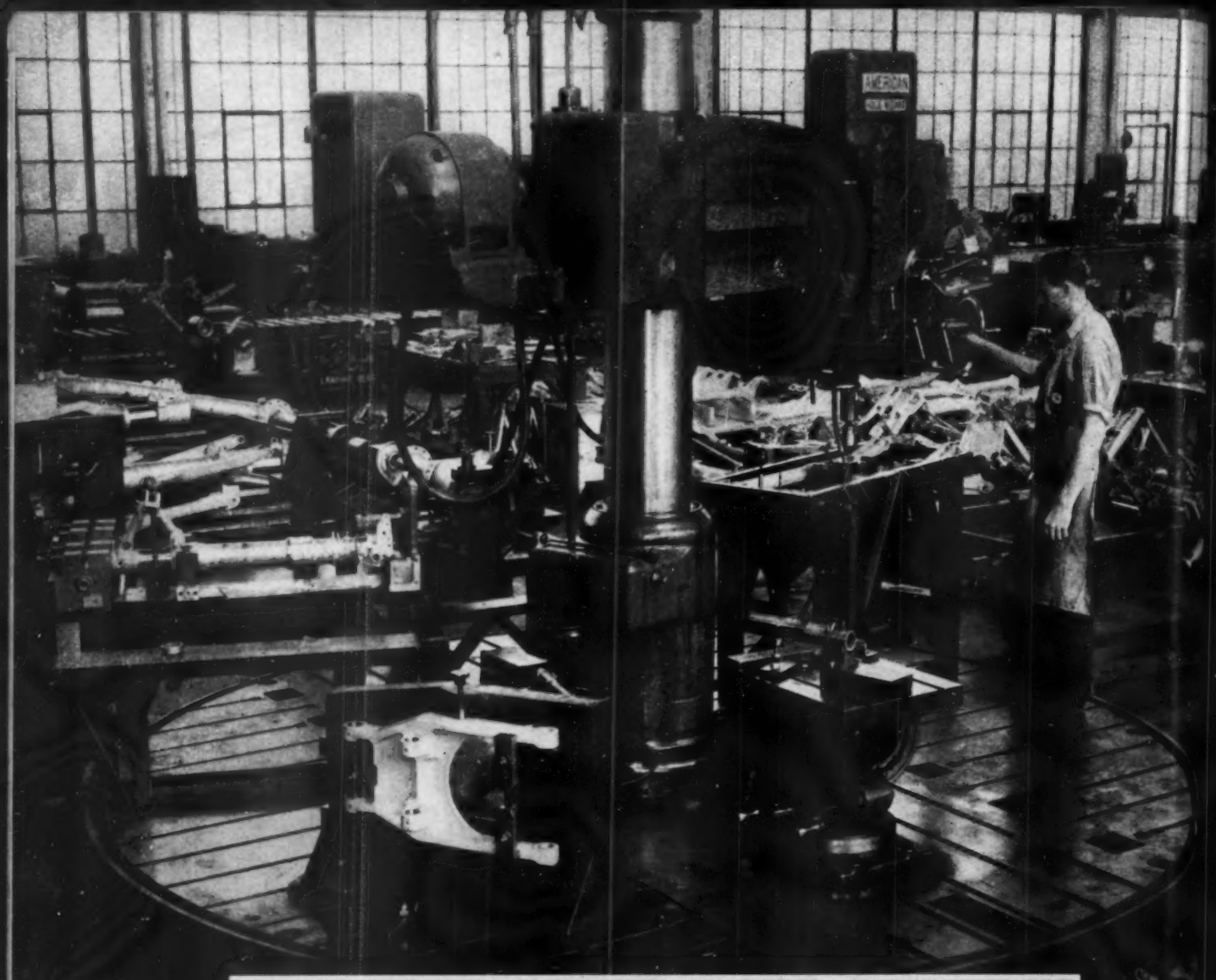


LANDIS PRECISION THREAD GRINDER

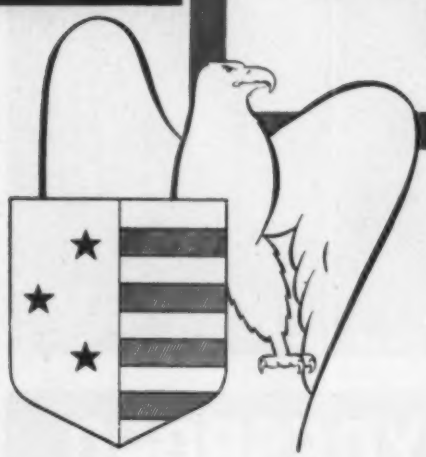
LANDMACO THREADING MACHINE

S MACHINE CO. WAYNESBORO PENNA. U.S.A.

COLLAPSIBLE TAPS • PIPE THREADING AND CUTTING MACHINES



IDLE MACHINE TIME *ELIMINATED*



As the illustration shows, this "American" Hole Wizard Radial Drill is equipped with a circular base. This base permits multiple work set-ups for successive operations, thus completely eliminating idle machine time resulting from changing from one work set-up to another.

This is one plant's contribution to solving the man power shortage. By keeping its machines in constant operation, it reduces man power requirements to an absolute minimum.

"American" Hole Wizard Radials are meeting the demands of such continuous service.

THE AMERICAN TOOL WORKS CO. CINCINNATI, U.S.A

Lathes and Radial Drills

P&J's

40 YEARS OF "KNOW-HOW" IN PRODUCING DUPLICATE PARTS . . .

. . . a valuable asset in speeding war production

The remarkable war-materiel production figures that are released from time to time are evidence that somewhere back in the metal-working shops of this Nation men and machines have been busy applying better ways and means for turning out an almost unlimited variety of parts for the machines of war. For tanks, planes, guns, motor vehicles, ships and shells are an assembly of parts.

P & J Automatic Chucking Equipment was developed many years before the present war, for turning out duplicate parts accurately and in quantity. P & J engineers have been applying their long experience toward achieving faster and faster parts production. The result has been a valuable contribution to today's war effort. The outstanding records for which the entire metal-working industry can well be proud have been made possible by organizations which, like P & J, have devoted their all in time, effort and technical skill to the problem of attaining more and better production.

The POTTER & JOHNSTON MACHINE CO.
Pawtucket, R. I.

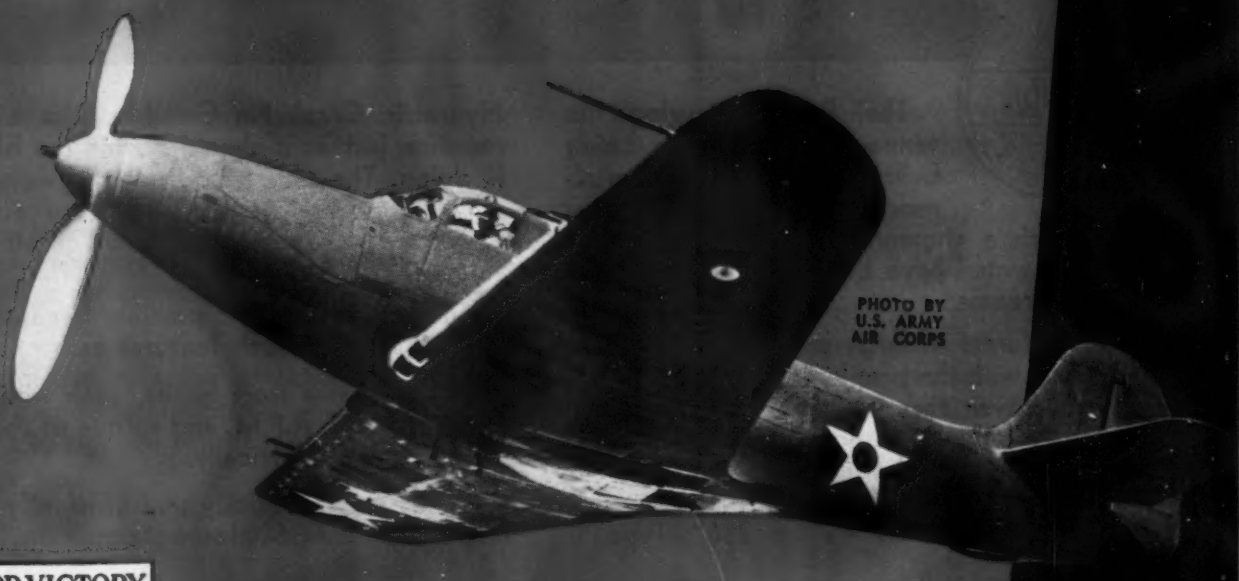
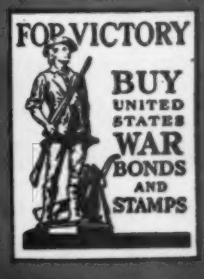


PHOTO BY U.S. ARMY AIR CORPS



Our Boys are Buying Bonds and FIGHTING—
What are you doing?

57 Tons of

PRECISION LANDIS GRINDERS

The figures showing the tonnage of ships now being built in this country seem almost fantastic. Anyone predicting such a stupendous output only a few years ago would have been considered an impractical dreamer.

Manufacturers of large marine engines have been faced with the problem of increasing their production over and over again to keep pace with the launchings. Among the recently developed machine tool equipment which has enabled them to successfully play their part has been the new Landis 40" x 216" Type B Hydraulic Crank Pin Grinder. It is a massive machine just as it should be for the big job it is doing. The pins of crankshafts weighing up to 5000 pounds are being ground accurately and on a production basis not heretofore attained.

This performance is possible because of the development of such features as:

a. Two massive work heads, each with its own drive and with R.P.M. and torque of the motors synchronized electrically.

b. A means for quickly and efficiently correcting any out-of-balance condition of the

Unusual Performance as Usual

crankshaft along with provision for positively determining when the crankshaft is perfectly balanced.

c. A special work rest at the center main bearing which supports the weight of the shaft by means of generous sized water cooled lignum-vitae bearings.

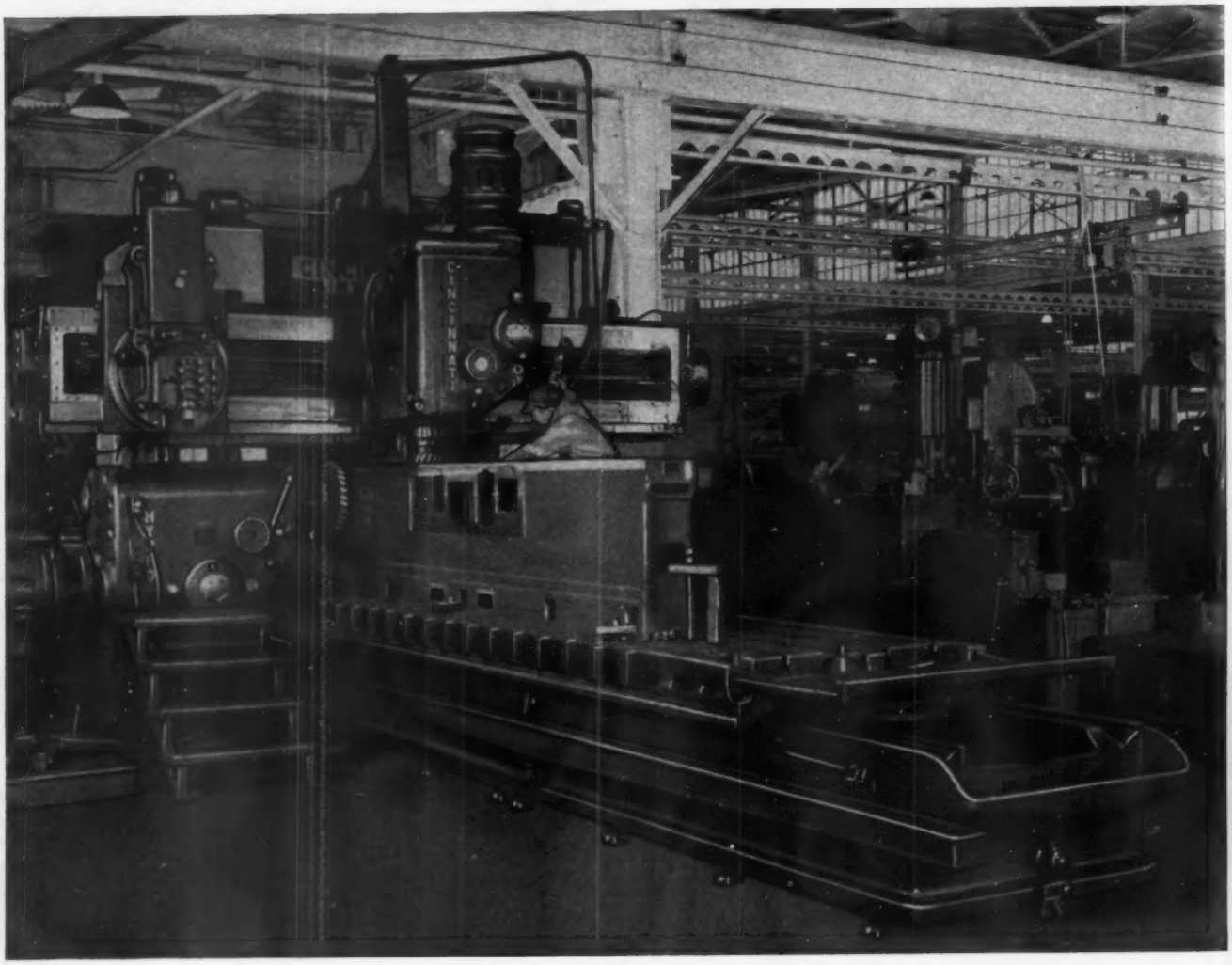
d. A shoulder grinding attachment ruggedly built for rapid metal removal, whether grinding from left to right or right to left.

e. Complete electrical control from a control desk at the front of the machine and a grouping of certain dual controls at the front of the wheel base.

A machine of this kind is a specialty which only a few manufacturers can use. However, its development by one of the country's oldest and largest manufacturers of Crank Grinders is another indication that anyone with a crankshaft grinding problem may unhesitatingly bring it to Landis for solution. 425

LANDIS TOOL CO.
WAYNESBORO—PENNA.

Cutting metal in a fraction of the time with a Cincinnati Hypro Combination Planer and Milling Machine



• The heaviest machine in the plant of a large machine tool manufacturer is this Cincinnati Hypro Combination Planer and Milling Machine. Because of the rigidity of the machine it is possible to use sintered carbide cutters of unusually large size. The vertical and horizontal cutters rough and finish grinder bed castings.

• There is also available, without resetting the casting, a special heavy duty planer head shown on the left above. This head is used for large multiple tool planing, a feature with unlimited Hypro-duction possibilities. Write for Bulletin 105-AM describing this cost cutting machine tool.

THE CINCINNATI PLANER COMPANY
Planers...Vertical Boring Mills...Planer Type Millers
CINCINNATI . OHIO . U.S.A.

FOR PRODUCTION AND ACCCURACY

Catalog No. 10 gives complete details on METRO Gages both Plug and Ring and on all METRO TOOLS. Send for your copy.

METRO TOOL AND GAGE CO

4240 PETERSON AVE.
CHICAGO, 30, ILL.

DISC WHEELS...

NORTON ABRASIVES

For All Types of Disc Grinders and All Kinds of Work

Solid and Segmental Types

Plate and Inserted Nut Mountings

Alundum, 19 Alundum, 38 Alundum and Crystolon Abrasives

Vitrified, Silicate, Resinoid and Shellac Bonds

A Wide Variety of Grains, Grades and Structures

If you are using discs or have a surfacing operation where discs can be used, Norton abrasive engineers will be glad to study your jobs and specify for each the disc that will assure maximum production. The complete line of Norton Discs meets all requirements.

The Norton line of disc wheels is completely described in the booklet "Disc Grinding — A Production Operation." Write for a copy. Just ask for Form 1141-AM.

NORTON COMPANY, WORCESTER 6, MASS.
New York Chicago Detroit Philadelphia Pittsburgh
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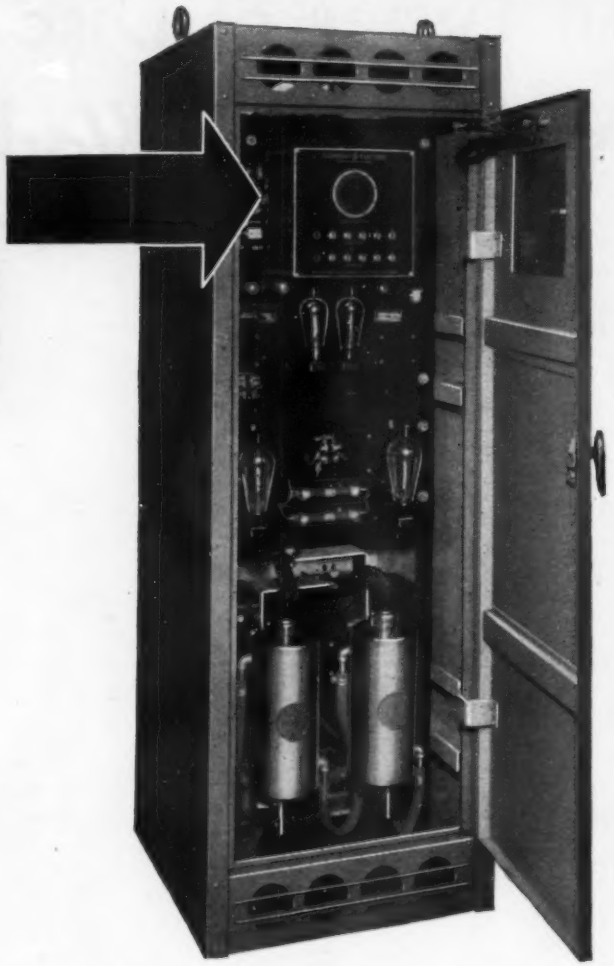
W-946

NORTON ABRASIVES

New Electronic Control for Seam Welding



Timing and heat control on the panel for easy adjustment

●

Simplified design for easy installation and easy servicing

●

Fully electronic for high accuracy and low maintenance

FOR seam-welding operations where frequent changes of the timing pattern are required, we recommend this new, *fully electronic,* resistance-welder control (CR7503-B110).

Snap switches on the front of the panel provide easy and instant adjustment of heat-time and cool-time, independently, in one-cycle steps from 1 to 30 cycles. Smooth, accurate heat adjustment is obtained by the phase-shift method, and the value is indicated on a graduated dial, also located on the front of the panel. Timing switches and heat-control dial are conveniently located—machine setting can be determined at a glance.

Easy to Install and Service

All tubes are on the front of the panel; connection terminals are conveniently located; small resistors and capacitors are mounted on the terminal board for ease in checking; water connections are on the outside of the case. Indicating lights at the top of the panel show instantly whether water flow is adequate, whether power has been applied to the panel, and whether the time-delay relay has timed out.

Consistent Results

The panel utilizes synchronous timing; therefore, the control of the weld current is precise, and uniform welds are produced. Normal variations in line voltage do not affect timing. Welds are consistent, rejects are few. The equipment contains no moving parts—maintenance is low.

Ask our nearest office about the CR7503-B110. *General Electric Company, Schenectady, N. Y.*

ELECTRONIC CONTROL

BUY WAR BONDS

GENERAL ELECTRIC

How to turn compound tapers!

Compound tapers are tricky to turn, especially to the extremely close tolerances required for gun barrels. Here is how it is done fast and accurately on the Monarch form turning lathe.

1. The work—.30 caliber gun barrel with compound taper.

2. This 4-jaw roller-type follow rest has adjustable spring tension on each jaw. Eccentric levers enable the operator to engage the jaws with the work, one ahead and the other behind the cut.

3. The Monarch double follower forming attachment works from a single template, with the rear follower spring loaded. Index automatically guides the tool to produce the required shape.

4. The length variator for the forming attachment allows the use of a template which may be longer or shorter than the work itself.

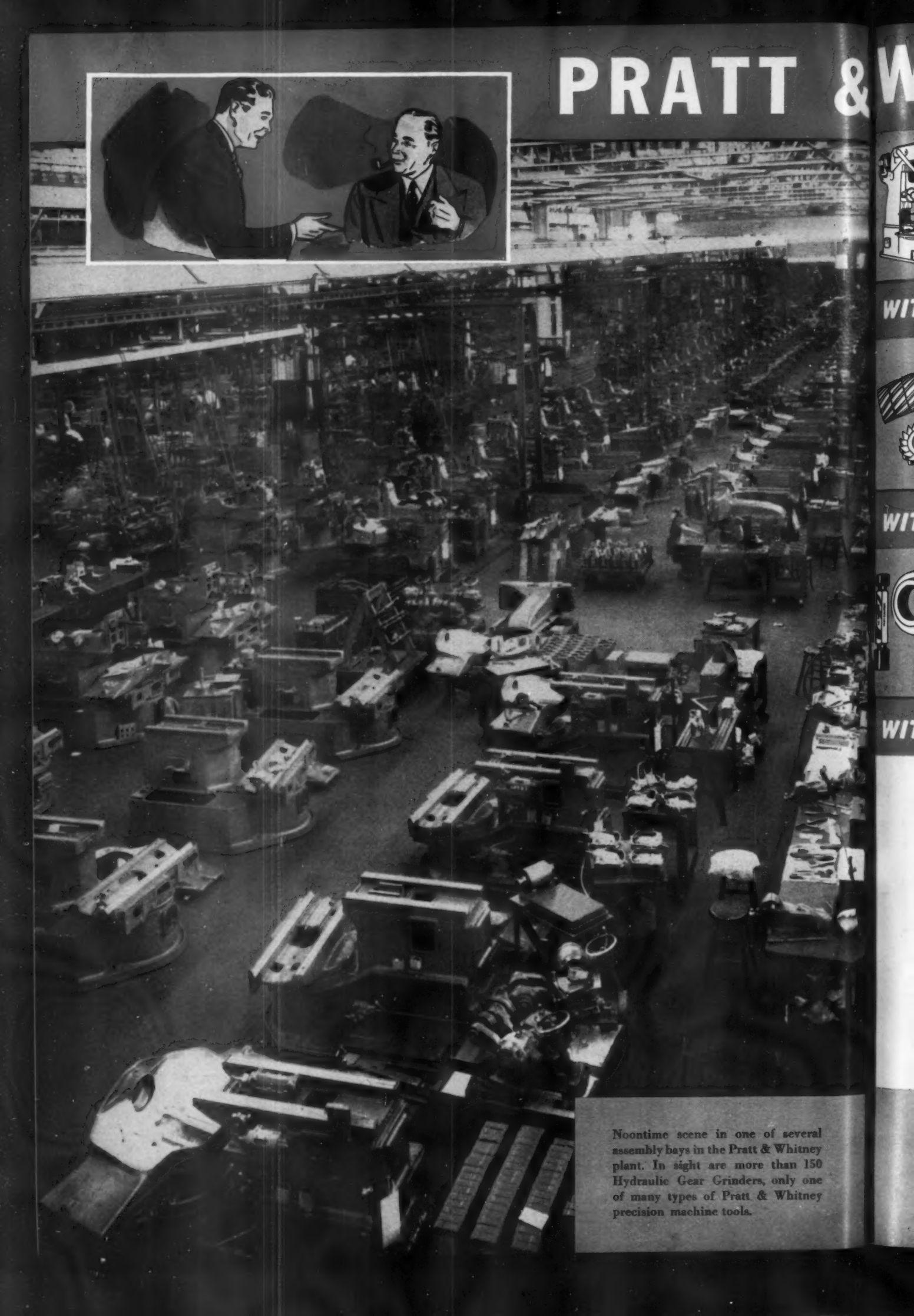
With this Monarch equipment, the variations of manual control are eliminated —and of prime importance—one operator can tend two or three machines, releasing manpower for other work.

And when production of the things for better living . . . more goods for more people at lower cost . . . can start again, Monarch lathes will give as good performance as they have in war production.

THE MONARCH MACHINE TOOL COMPANY • SIDNEY, OHIO

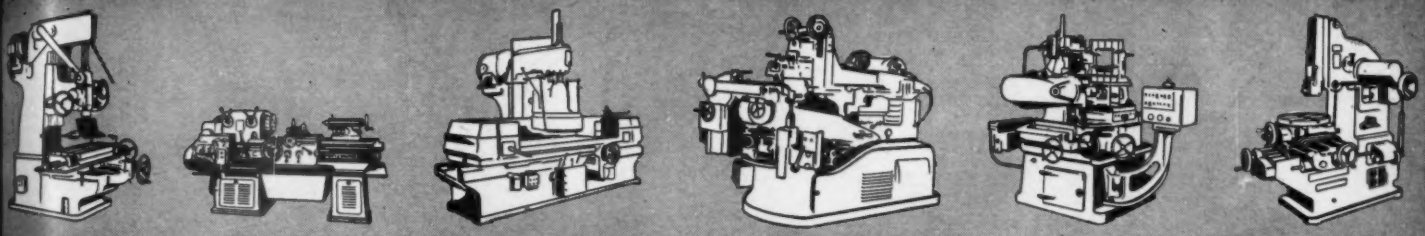
MONARCH LATHES

Save Time

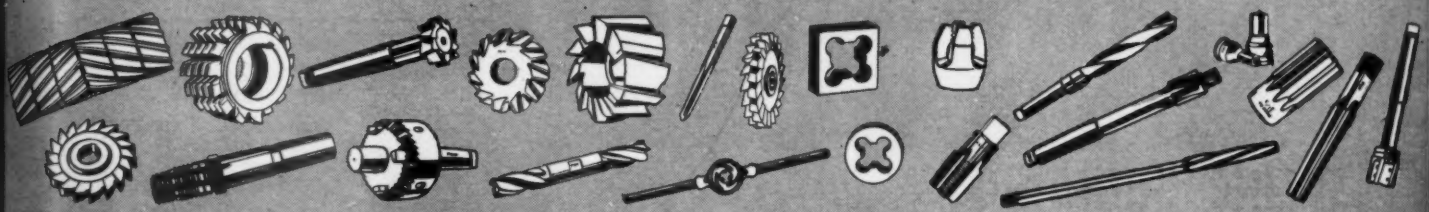


Noontime scene in one of several assembly bays in the Pratt & Whitney plant. In sight are more than 150 Hydraulic Gear Grinders, only one of many types of Pratt & Whitney precision machine tools.

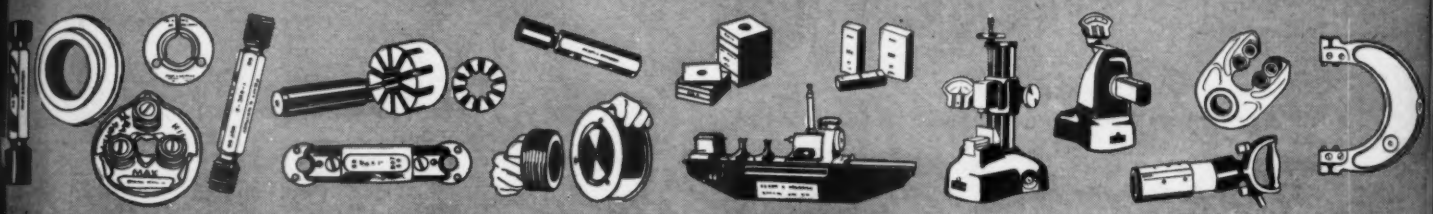
& WHITNEY *reports to Industry*



WITH THOUSANDS OF MACHINES THAT MAKE MACHINES



WITH HUNDREDS OF THOUSANDS OF SMALL TOOLS



WITH CARLOADS OF GAGES AND BASIC MEASURING EQUIPMENT

WARS are not new to Pratt & Whitney. During the past eighty-three years we've served faithfully thru *many* wars . . . delivered to American and Allied industry the kind of goods from which victory has been shaped.

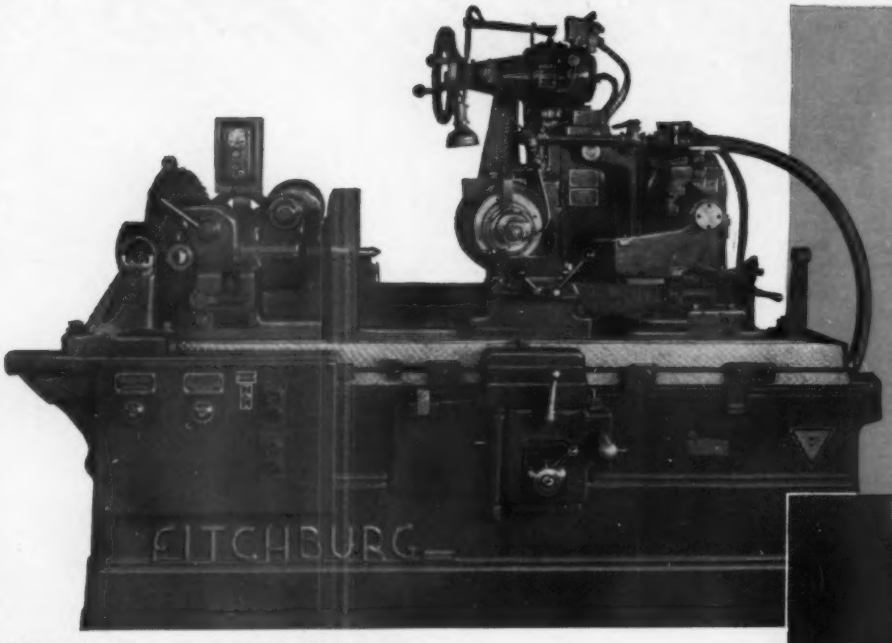
In the present war — from its very beginning — our machines, small tools, and gages have been sought after. We've met that demand in full — with a production record far greater than ever before. During 1942 we produced over FIVE TIMES our best normal peacetime level. In 1943, just passed, we bettered even that. But this record was not achieved by hurrying. You cannot rush Accuracy — not the kind of accuracy that is the bloodstream of the Pratt & Whitney organization. We have enlarged our facilities several times, added and trained new thousands of workers. But thru it all we have held tenaciously to the well-known Pratt & Whitney standard of highest precision workmanship and top quality. The war-time performance of our products has proved this true over and over again.

We didn't have to convert to war — we simply had to make "more of the same thing"— so today, our organization is larger and better trained than ever — ready to carry on to ultimate victory — and into the peacetime years ahead.

PRATT & WHITNEY

Division Niles-Bement-Pond Company

WEST HARTFORD, CONNECTICUT, U. S. A.



This book shows how to cut grinding costs . . . Sent free . . . write for it today.

SPLINE GRINDING?
SPLINE SHAPING?
INTERNAL GEAR GRINDING?
EXTERNAL GEAR GRINDING?

.... Do all four on the Fitchburg Gear Grinder

Spline Shaper Attachment

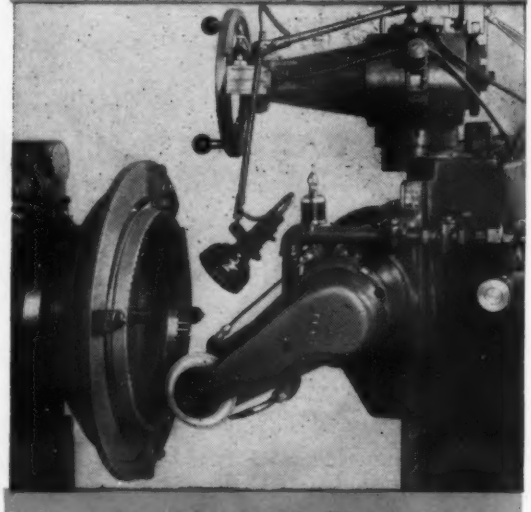
A single Fitchburg Gear Grinder, with special attachments will

GRIND internal or external, helical or spur gears — straight, taper and helical splines, and will also

SHAPE straight, taper and helical splines.

A leading automobile manufacturing plant now engaged in making airplane engines, is using Fitchburg Gear Grinders with Special Wheelheads in the important operation of grinding internal gears. They give highest praise to its accuracy, fine finish and high production at low cost.

You can get the same results on a variety of work—on this one machine—why not let Fitchburg engineers show you how. Write today.



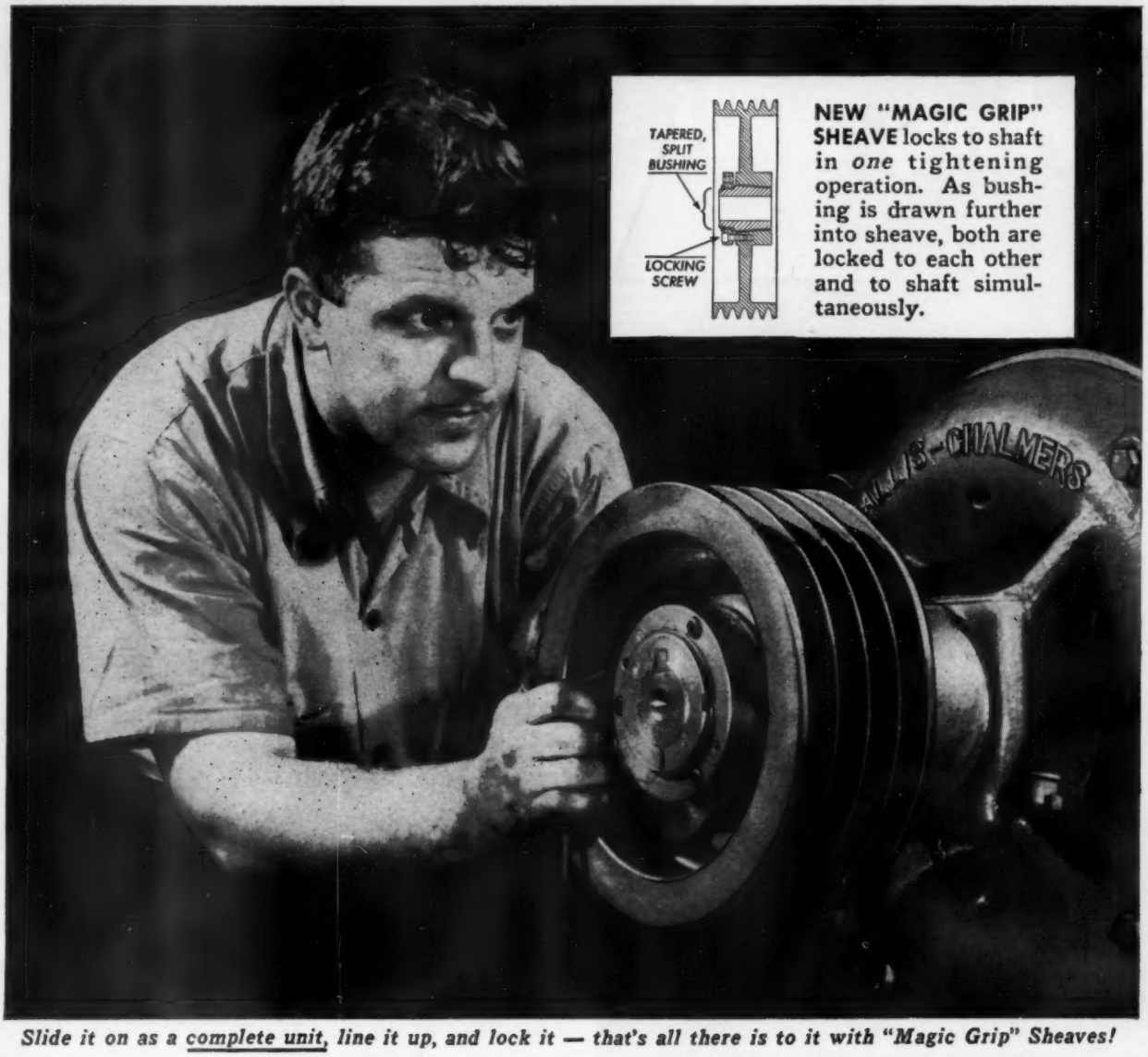
Internal Gear Grinding Attachment

FITCHBURG GRINDING MACHINE CORP.

FITCHBURG, MASSACHUSETTS, U. S. A.

Manufacturers of—Bowgage Wheelhead Units, Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Bath Full Universal Grinders and Special Purpose Grinders.

PRODUCT OF THE MONTH


TAPERED, SPLIT BUSHING
LOCKING SCREW
NEW "MAGIC GRIP" SHEAVE locks to shaft in *one* tightening operation. As bushing is drawn further into sheave, both are locked to each other and to shaft simultaneously.
ALLIS-CHALMERS

Slide it on as a complete unit, line it up, and lock it — that's all there is to it with "Magic Grip" Sheaves!

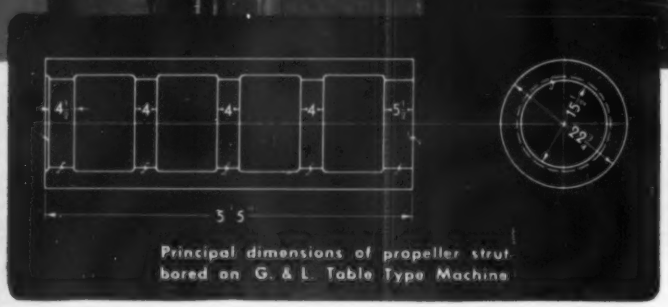
MILWAUKEE, WIS.—Allis-Chalmers announces the new "Magic Grip" Sheave . . . designed to save man-hours and money by going on or off faster than any other sheave on the market. New "Magic Grip" Sheave fits undersize or oversize shafts, centers perfectly, runs smoothly. Send for Bulletin B-6310.

A 1679

WE WORK FOR VICTORY · WE PLAN FOR PEACE

ALLIS-CHALMERS · MILWAUKEE · WISCONSIN

How to Bore Deep Holes on Your Horizontal Boring Mill



Principal dimensions of propeller strut bored on G. & L. Table Type Machine

(Above) Operation view showing simplified method of setting up and clamping 8000-lb. steel weldment prior to machining.

G.&L. Table Type Machine Does the Job with Simple Set-up and Tooling...

If you have occasional deep hole boring operations, with or without intermittent cuts, you will be interested in how this manufacturer simplified the job.

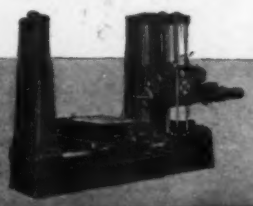
The large weldment weighs approximately 8000 lbs. and requires boring and face milling of both ends. Only rough boring operations are required. Note the simplicity of set-up. Details of the operation are shown on the opposite page.

This is another interesting example of how G. & L. Horizontal Boring, Drilling and Milling Machines are used to perform an endless variety of machining operations. If you have any problems in connection with your horizontal boring, drilling and milling machines, G. & L. engineers will be glad to work with you in finding the most practical solutions. You can use their experience without obligation.

G&L

GIDDINGS & LEWIS

138 DOTY STREET


Right: G. & L. Table Type Machine.

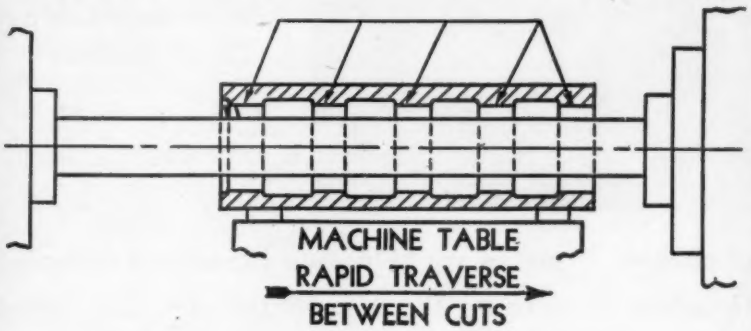
Right: G. & L. Floor Type Machine.

OPERATIONS

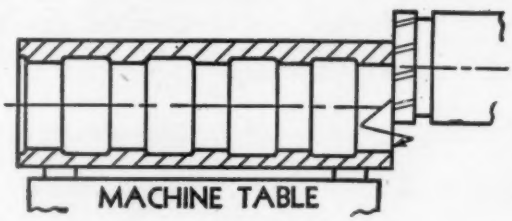
The cylinder is rough bored and face milled on both ends in two set-ups. Face milling operations are performed because the surface to be machined is $3\frac{5}{8}$" wide. This surface, if smaller, could be machined by back-facing with the boring bar.

First Set-up

Weldment is loaded on machine as shown in the illustration on the opposite page. The intermittent bores are then machined by feeding through each cut and applying the rapid traverse of the table in between cuts. Two rough boring cuts are performed. Subsequent finish boring operations are performed after installation with portable boring equipment. The second operation in the first set-up consists

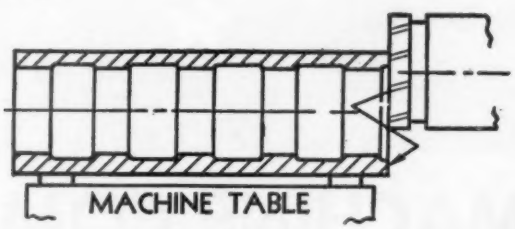


of face milling the end. Milling is performed by utilizing the feed of both the machine headstock and table.



Second Set-up

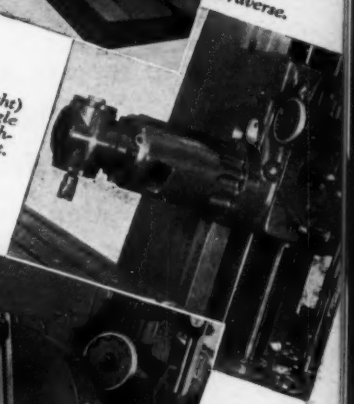
The weldment is now turned 180° on the table and the opposite end face milled similar to the second operation in the first set-up.



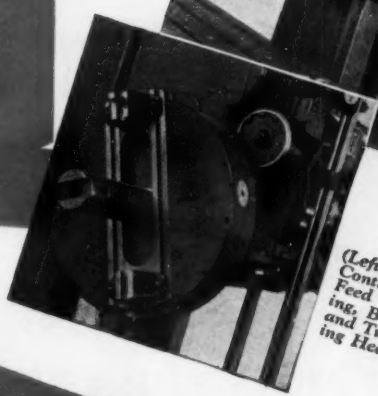
Do More Jobs . . . Save More Time with G.&L. Attachments and Accessories

These are only three of many G. & L. accessories and attachments designed and built to increase machine flexibility and save time. If your work includes an endless variety of parts, you can use some of these attachments profitably. For instance, the Continuous Feed Facing, Boring and Turning Head makes it possible to face and bore simultaneously. Many other operations and combinations of operations, not ordinarily performed with the Horizontal Boring, Drilling and Milling Machine, are possible with this attachment. Write for the G. & L. General Catalog which describes all additional time-saving devices.

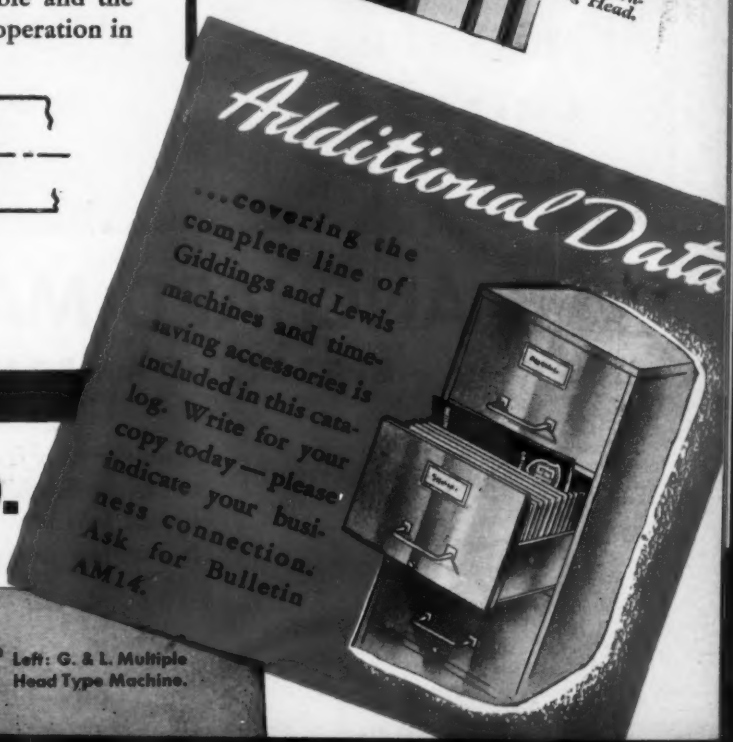
(Left) Precision Rotary Table with Power Feeds and Rapid Traverse.



(Right) Right Angle Attachment.

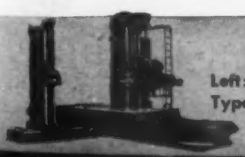


(Left) G.&L. Continuous Feed Facing, Boring and Turning Head.

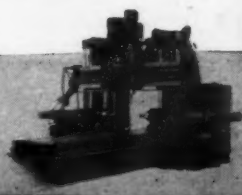

Additional Data
. . . covering the complete line of Giddings and Lewis machines and time-saving accessories is included in this catalog. Write for your copy today — please indicate your business connection. Ask for Bulletin AM14.

MACHINE TOOL CO.

FOND DU LAC, WIS.



Left: G. & L. Planer Type Machine.



Left: G. & L. Multiple Head Type Machine.

"PUT IT ON THE BLANCHARD"

Grinding Main Housing Poles for Magnetos on a No. 18 Blanchard Surface Grinder

Ability to remove metal quickly and cheaply makes it possible for Blanchard Grinding to carry through from roughing to finishing in one operation.

These Housing Poles for magnetos have .140" stock to remove from steel laminations. Ten pieces are held on a Blanchard designed fixture on the No. 18 Grinder and 30 pieces are finished per hour.

The weight and rigidity of the Blanchard are essential for economical machining of parts such as these.

CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

- ★ **Production**
- ★ **Adaptability**
- **Fixture Saving**
- ★ **Operation Saving**
- **Material Saving**
- **Fine Finish**
- **Flatness**
- **Close Limits**

★ . . . . *Especially valuable on jobs like the one illustrated.*

The BLANCHARD MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASSACHUSETTS

BLANCHARD

Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.

DESCALED IN 5 MINUTES

WITH NO DIMENSIONAL CHANGE

HAS YOUR DESCALING PROCESS ALL THESE FEATURES?

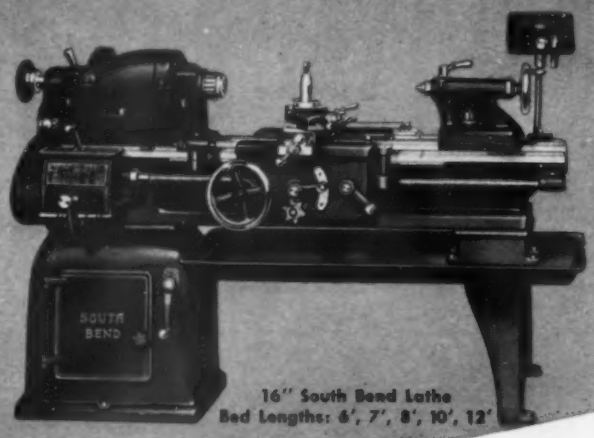
- Rapid and economical
- No dimensional changes
- No etching
- Produces chemically clean surfaces
- Easy to operate
- Can be fully conveyorized
- Long solution life

2496 teeth to each of these pieces!

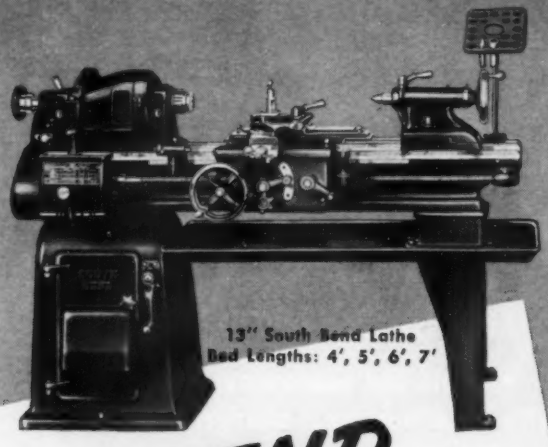
And a whole tank load of them can be cleaned in the same 5 minutes. What plant manager does not value such a saving of time these days? That's a reason why so many companies are using the Bullard-Dunn Process for descaling heat-treated work. It not only saves time—it cleans parts with tiny crevices, such as those pictured here, as rapidly and thoroughly as flat pieces. And it leaves surfaces chemically clean, ready for any subsequent operation. See the list above for other important advantages. Write today for booklet; send us your samples too, if possible—and you'll be on your way to "a better job, in shorter time".

BULLARD-DUNN *Process*

BULLARD-DUNN PROCESS DIVISION
OF THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT



16" South Bend Lathe
Bed Lengths: 6', 7', 8', 10', 12'



13" South Bend Lathe
Bed Lengths: 4', 5', 6', 7'

SOUTH BEND LATHES

Engine Lathes · Toolroom Lathes · Turret Lathes

Time, material, and manpower can be saved for vital work if you use the right lathe for every job. The matching of the job and the lathe has never been more important than it is today—in no other way can maximum production be obtained. Remember that versatility and precision are important in a toolroom lathe. For manufacturing operations, a lathe must also have plenty of power, speed, and stamina.

South Bend Engine Lathes are made in 9", 10", 13", 14½", and 16" swings, with bed lengths from 3' to 12'. The Toolroom Lathes are made in 10", 13", 14½", and 16" swings, with bed lengths from 3' to 8'. The Turret Lathes are made in 9" and 10" swings, with 3½' bed lengths. These lathes are described in Catalog 100C which will be sent upon request.

SOUTH BEND LATHE WORKS
South Bend 22, Indiana
Lathe Builders For 37 Years

10" South Bend Turret Lathe

9" South Bend Lathe
Bed Lengths: 3', 3½', 4', 4½'

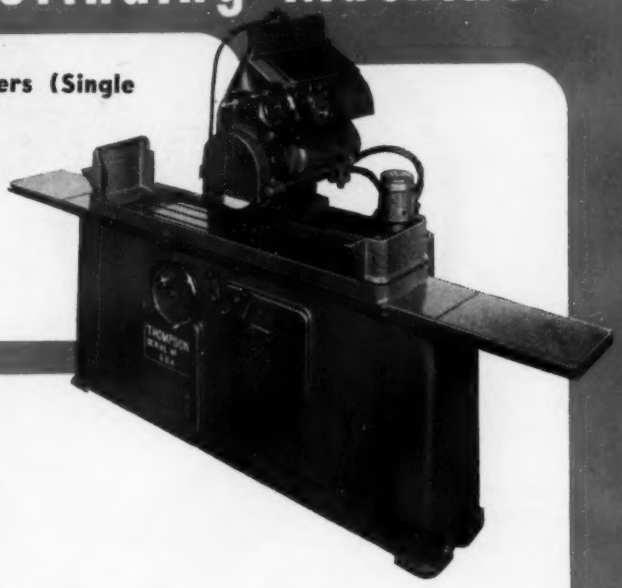
10" South Bend Lathe
Bed Lengths: 3', 3½' 4', 4½',

14½" South Bend Lathe
Bed Lengths: 5', 6', 7', 8', 10'

The THOMPSON line includes a wide range of Hydraulic Surface Grinding Machines

Machine Tool Way Grinders (Single and Dual Wheel Heads)
Slot Grinding Machines
Special Aircraft Grinders
Spline Grinders

TYPE F — A sensitive high speed tool room and production surface grinder. Hand and hydraulic feeds to head and table. Precision table ways; double length box bed; 6" x 10" x 18".



TYPE B — A sturdy, extremely accurate, heavy duty tool room grinder, built for many years of dependable accuracy. Both hand and hydraulic feeds are available. Made in sizes 6" x 12" x 18" to 12" x 12" x 60". Also a line of heavy duty die grinders, identified as type "BB".

TYPE C — Large capacity, heavy duty, precision surface grinders for work 12" to 36" wide, 16" to 36" high, and 40" to 240" long. Cutting feed range of 10 feet to 100 feet per minute. Automatic hydraulic feeds to head and table.

Broach Grinders in sizes 6" x 48" to 12" x 72" for flat or round broaches—gumming and relieving. Heavy duty and fully automatic. Electric Locator guarantees accurate tooth spacing.

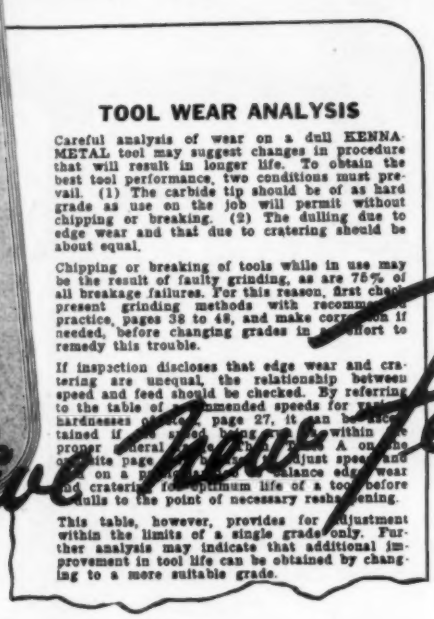
WRITE
for full descriptive bulletins or ask for representative to call

THE Thompson GRINDER CO.

SPRINGFIELD, OHIO

Re-Issued

with a Distinctive New Feature



TOOL WEAR ANALYSIS

Careful analysis of wear on a dull KENNAMETAL tool may suggest changes in procedure that will result in longer life. To obtain the best tool performance, two conditions must prevail. (1) The carbide tip should be of as hard grade as use on the job will permit without chipping or breaking. (2) The dulling due to edge wear and that due to cratering should be about equal.

Chipping or breaking of tools while in use may be the result of faulty grinding, as are 75% of all breakage failures. For this reason, first check present grinding methods with recommended practice, pages 38 to 48, and make correction if needed, before changing grades in an effort to remedy this trouble.

If inspection discloses that edge wear and cratering are unequal, the relationship between speed and feed should be checked. By referring to the table of recommended speeds for various hardnesses on page 27, it can be ascertained if the speed being used is within the proper general range. A on the opposite page [illegible] adjust speed and feed on a particular job to balance edge wear and cratering for optimum life of a tool before it dulls to the point of necessary reshaping.

This table, however, provides for adjustment within the limits of a single grade only. Further analysis may indicate that additional improvement in tool life can be obtained by changing to a more suitable grade.

A revised edition of our Tool Manual is just off the press. It has been brought up to date and a new section added, called "Tool Wear Analysis."

Unique ways and means for determining how overall performance may be improved following visual inspection of a dull tool are described and illustrated by charts. The analysis is based on the premise that the best tool performance and maximum life between regrinds is realized when conditions are such that the dulling of a carbide tip due to edge wear and dulling due to top surface wear are maintained in balance, and at a minimum.

This new section of the Manual suggests that a check be made: First, of the prevailing grinding methods to see if they are in harmony with recommended practice; second, of the cutting speed used, to ascertain if it is within the prescribed general range for the particular material being machined. A chart is provided to show the proper relation between speed and feed, and how adjustment may be made in this respect for best results as to wear resistance on a particular job within the limits of a single carbide grade. Finally, characteristics of the several KENNAMETAL grades are given with charts provided to facilitate analysis and to determine if a change in grade would be advisable to effect improvement.

You will, of course, want this valuable manual with its distinctive new feature; it will help assure the continued efficiency of your KENNAMETAL tools. A copy will be forwarded upon request.

The revolutionary method of analysing tool wear discussed in the KENNAMETAL Manual is also available in the form of a wall chart especially designed for shop and tool room use. Write for yours today.

KENNAMETAL

Trade Mark Reg. U. S. Pat. Off.

KENNAMETAL *Inc.*
103 LLOYD AVE.
LATROBE, PA.

SUPERIOR CEMENTED CARBIDES

What's Ahead?

No. 1 in a Series

Experts are working experimentally on a universal sign language for use during the period of reconstruction following the war. It has a vocabulary of about two thousand words and can be learned in about a month.

★

Reshingling of homes may be entirely eliminated after the war. With plentiful cheap aluminum as one of the benefits of the great disaster, we expect to have aluminum shingles, and the glass industry has already developed a lifetime glass shingle.

★

Radio waves are now being used to spread the layer of tin on tin cans and thinner than it was before the war.

★

The Diesel engine is close to its long-sought ideal of one pound per horse power. This may indicate that this thrifty engine, already scheduled to power our postwar trucks, may also be suitable for our pleasure cars.

★

Little by little new ideas combine to make flying more practical for tomorrow's civilians. One of these is a simple device for night landing which uses two lamps aimed toward the ground. The beams of these lamps are focused so that they come together to form a single spot of light on the ground when the plane is at exactly the right height for "setting down."

★

A new fuse for artillery shells is said to be so sensitive that it will explode the shell on hitting a raindrop.

★

The use of aluminum can reduce the weight of a freight car from forty-five thousand to fifteen thousand pounds with a corresponding increase in capacity.

★

Factories have been built with heating pipes permanently laid in the solid concrete floor. The method seems to be practical, economical and suitable for the heating of our homes.

★

In spite of the war, the Dutch have been able to produce a new hybrid plant, a cross between the carrot and the beet called the "wobbie".

To supply a Pacific coast shipyard with 152' one-piece keels for Navy minesweepers, giant trailers are being used that haul 60 tons of Douglas fir logs of this length.

★

Experiments are being made with artificial teeth held in place by magnets.

★

It is expected that vast amounts of magnesium will be used after the war, and it is encouraging to know that our supply is large and beyond the reach of the enemy. Although there is only fourteen one-hundredths of one percent of magnesium in sea water, there are four and one-half million tons in a cubic mile.

★

Fifty thousand patents, formerly the legal property of our enemies, are now available to American industry.

★

The electron microscope will now measure particles as small as one-millionth of an inch.

★

The Civil Aeronautics Administration expects us to have half a million private and commercial airplanes by 1950.

★

A new synthetic textile filament, the finest yet produced by man or nature, is so small that it takes twenty thousand miles of it to weigh a pound.

Automobile tires are now being checked for invisible flaws by passing high-frequency sound waves through them

★

Plastic bearings for machinery will require no lubricants for moderate speeds and loads, and in many cases water has been found to give sufficient lubrication for even high speeds and heavy loads.

★

"Facsimile", a method of printing a miniature newspaper by radio in individual homes, was tried experimentally before the war began. By this method the printing is done during the night and a newspaper, complete with illustrations and advertising, is ready at breakfast time.

★

There is a very good chance that we may have television in full color and three dimensions. It may also be possible to store up television broadcasts to be re-run later.

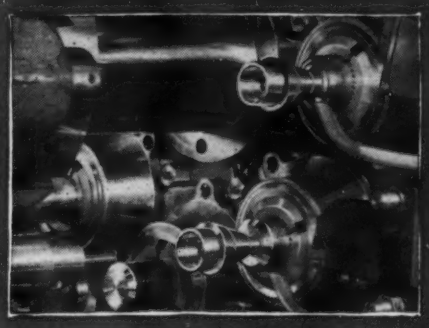
★

A micro-hardness tester is now made that can test a single microscopic grain of metal.

★

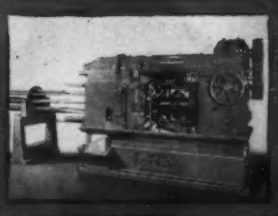
Shipwrecked sailors will soon have the benefit of a tiny searchlight no bigger than a walnut that is visible for 60 to 70 miles and good for 100 hours of use.

★



This big 8 spindle Conomatic completes seventeen operations required in the machining of an artillery shell fuse body in *18 seconds.*

This is real production—the sort of production needed to win the war. Manufacturers will need this sort of production *after the war* if they are to meet competition, particularly if new ideas and better merchandise are to be put in the hands of all our people.



CONE

AUTOMATIC MACHINE CO., INC.

WINDSOR, VERMONT, U. S. A.

HERE'S HELP FOR WAR WORKERS IN ALUMINUM

Eleven sound motion pictures, wall charts, instruction cards, many books of engineering and metallurgical data; all designed to help speed the war effort. This material is described in Alcoa's 1944 catalog of how-to-do-it helps. A detailed description of each item is included along with instructions for borrowing the films. Write for your copy today. ALUMINUM COMPANY OF AMERICA, 2107 Gulf Building, Pittsburgh, Pa.

Modern CLEVELAND Presses

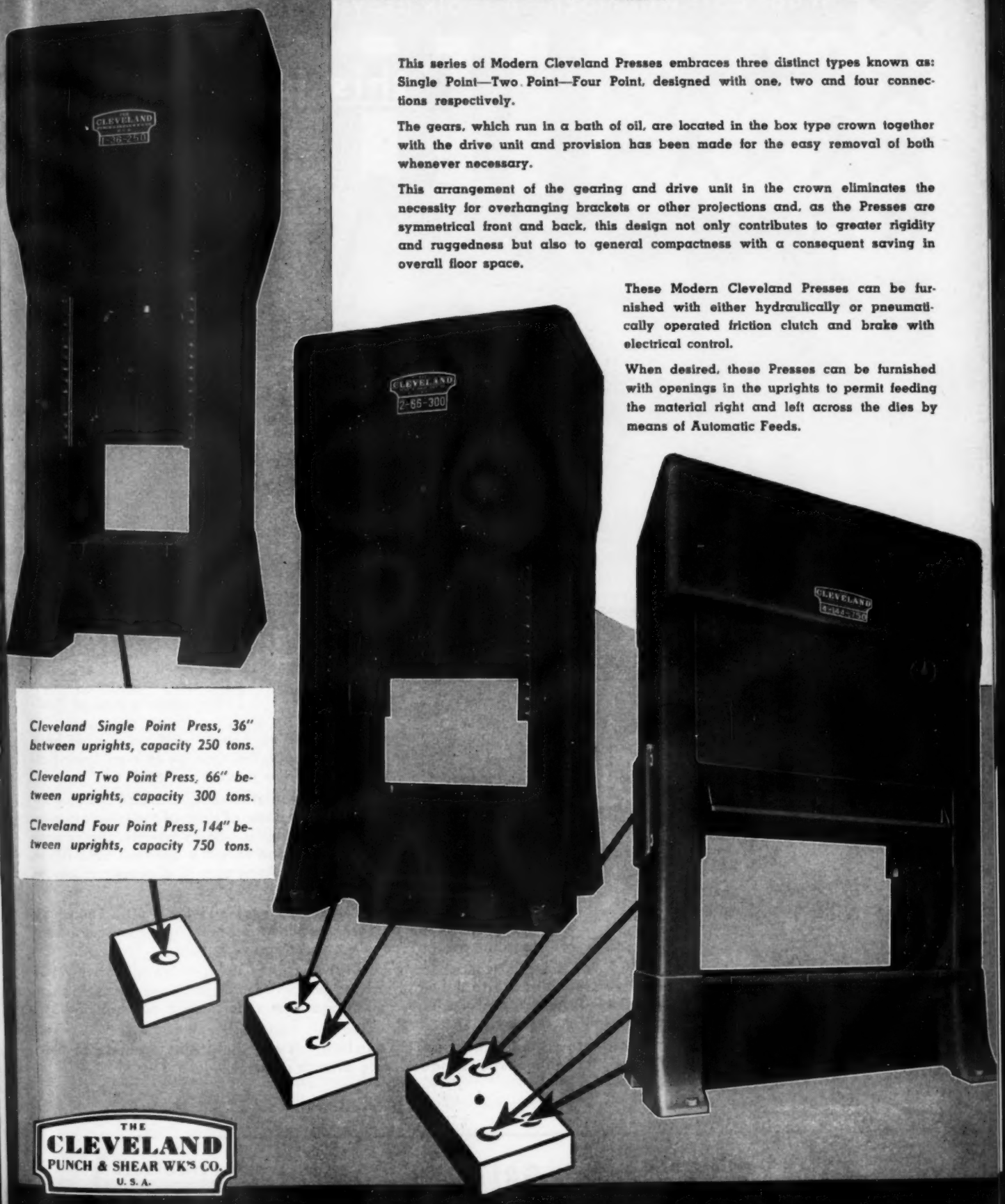
This series of Modern Cleveland Presses embraces three distinct types known as: Single Point—Two Point—Four Point, designed with one, two and four connections respectively.

The gears, which run in a bath of oil, are located in the box type crown together with the drive unit and provision has been made for the easy removal of both whenever necessary.

This arrangement of the gearing and drive unit in the crown eliminates the necessity for overhanging brackets or other projections and, as the Presses are symmetrical front and back, this design not only contributes to greater rigidity and ruggedness but also to general compactness with a consequent saving in overall floor space.

These Modern Cleveland Presses can be furnished with either hydraulically or pneumatically operated friction clutch and brake with electrical control.

When desired, these Presses can be furnished with openings in the uprights to permit feeding the material right and left across the dies by means of Automatic Feeds.



Cleveland Single Point Press, 36" between uprights, capacity 250 tons.

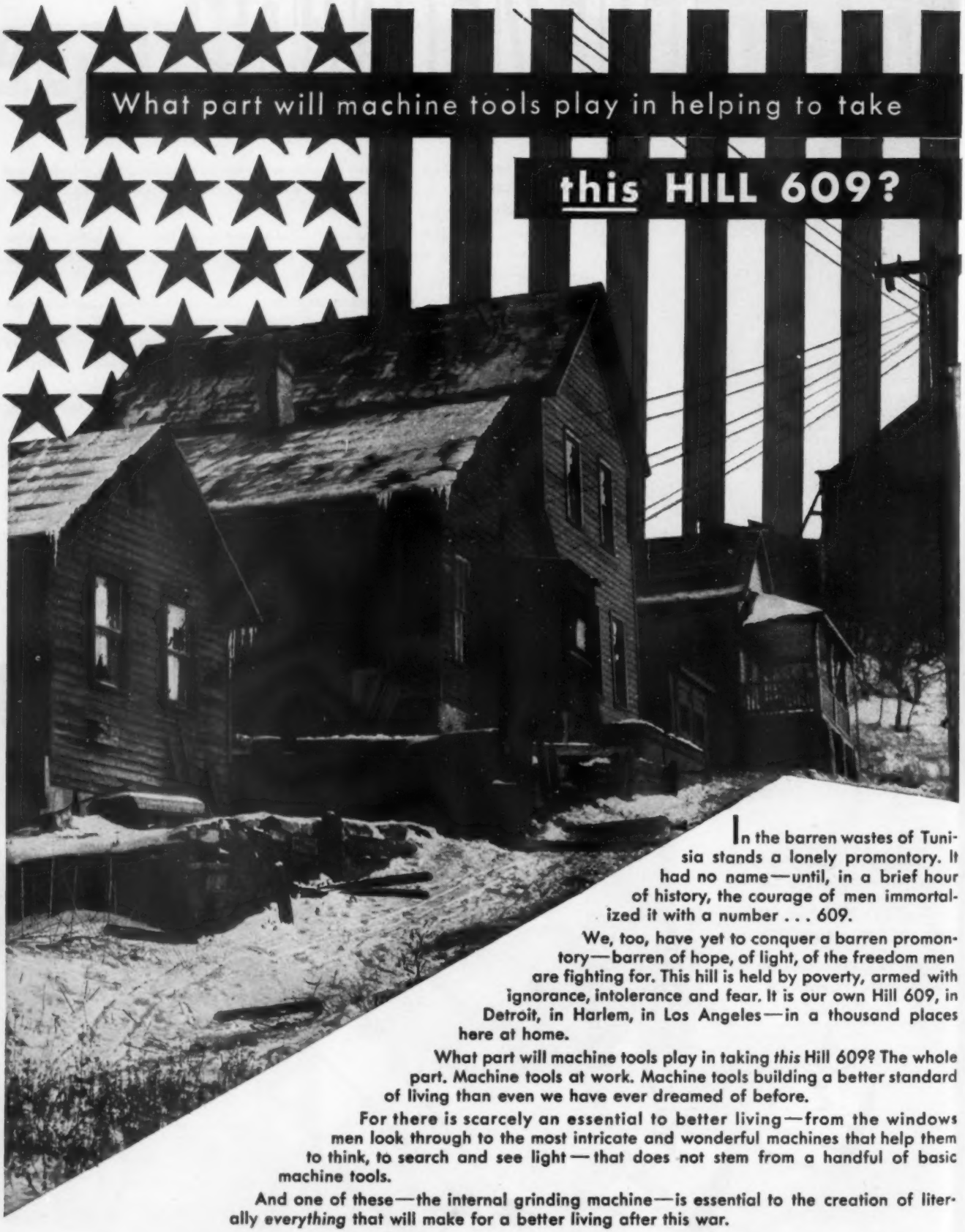
Cleveland Two Point Press, 66" between uprights, capacity 300 tons.

Cleveland Four Point Press, 144" between uprights, capacity 750 tons.

THE CLEVELAND PUNCH & SHEAR WK'S CO. U. S. A.

THE CLEVELAND PUNCH & SHEAR WORKS CO CLEVELAND · OHIO

What part will machine tools play in helping to take this HILL 609?



In the barren wastes of Tunisia stands a lonely promontory. It had no name—until, in a brief hour of history, the courage of men immortalized it with a number . . . 609.

We, too, have yet to conquer a barren promontory—barren of hope, of light, of the freedom men are fighting for. This hill is held by poverty, armed with ignorance, intolerance and fear. It is our own Hill 609, in Detroit, in Harlem, in Los Angeles—in a thousand places here at home.

What part will machine tools play in taking *this* Hill 609? The whole part. Machine tools at work. Machine tools building a better standard of living than even we have ever dreamed of before.

For there is scarcely an essential to better living—from the windows men look through to the most intricate and wonderful machines that help them to think, to search and see light—that does not stem from a handful of basic machine tools.

And one of these—the internal grinding machine—is essential to the creation of literally *everything* that will make for a better living after this war.

BRYANT

BRYANT CHUCKING GRINDER COMPANY SPRINGFIELD VERMONT, U.S.A.

MAINE STEEL, INC. *Reports . . .*

"Greatest Time and Money Saver in Die-sinking Machinery in 25 Years!"

"You may remember that about a year ago you sold us a Rotary Head Die-Sinking Machine. We feel that it is time that we told you what we think of it.

The Rotary Head principle has saved us more time and money than any other improvement in Die-Sinking Machinery since Cherrying Attachments were invented more than twenty-five (25) years ago.

The principal reason is that we can sink four (4) impressions complete without moving the work on the table.

This saves three (3) setups out of four (4) when compared to a Rotary Table Machine.

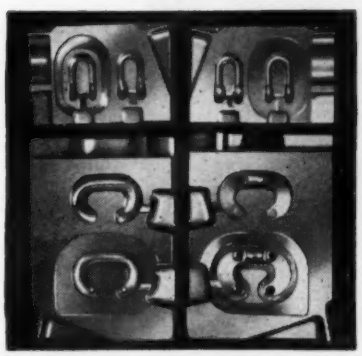
This saving would of course be increased where more than four (4) impressions are needed.

Besides this — the various movements built into this Rotary Head enable us to sink our dies without first laying them out on the Die Blocks.

The machine does its own layout work.

And after a year's experience we can say that these two features have averaged to save us over 30% of our die-sinking time.

Yours very truly,
MAINE STEEL, INC.
A. A. Rines
Foreman—Die Sinking Dept. "



This is typical of the forging dies produced by Maine Steel, Inc. The Milwaukee Rotary Head Miller has saved this firm over 30% in die-sinking time on dies of this type.

Kearney & Trecker's Rotary Head Miller is regarded by the majority of users as the most versatile machine ever designed for die and mold work. Direct — fast — accurate — it reduces initial job preparation and set-up time to the minimum — saves operator's time and assures rapid production of dies and molds. Write for Bulletin No. 1002C for full information on this unusual machine tool.

Rotary Head Milling Machine
•
Autometric Jig Borers
•
Center Scope

Kearney & Trecker *Products*
CORPORATION
Milwaukee, Wisconsin
Subsidiary of Kearney & Trecker Corporation

Milwaukee Face Mill Grinder
•
Milwaukee Midgetmill
•
Milwaukee Speedmill

HARDINGE
ELMIRA, N.Y.
Engineered
Circular Form Tools
for
Brown & Sharpe Machines
HARDINGE accuracy . . . special high speed steel . . . heat-treatment and ground finish assure proper part production.
HARDINGE Circular Form Tools are manufactured to your blueprint of the form tool or to a blueprint of the part to be produced.
HARDINGE Standard Circular Cut-off Tools are also available for Brown & Sharpe machines with varying blade thickness for different stock diameters or full machine capacity. These tools are threaded, hardened, ground and gashed . . . ready for use . . . and are packaged in individual containers.
HARDINGE BROTHERS, INC.
ELMIRA, N. Y.
HARDINGE
STANDARD
CUT-OFF TOOL
HIGH SPEED STEEL
COLLETS – FEED FINGERS – PADS – FORM TOOLS
FOR ALL MAKES OF AUTOMATICS, CHUCKING MACHINES AND TURRET LATHES

Use new Buying Data

TO REDUCE SELECTION AND ORDERING TIME

1/2

simplified

FOR QUICKER SELECTION . . .

EASIER ORDERING . . .

QUICKER DELIVERY . . .

When you need motors and control, consult your new Westinghouse Buying Data. It will help you to select and purchase the proper equipment—in ½ *the time.*

Data, as presented, is striking in its newness. It's easier to read, easier to understand, and easier to use than any offered previously by any manufacturer.

To fit widely varying requirements, this radically new Buying Data is available in two forms:

Motor and Control Loose-Leaf Book. This is for the use of large-scale purchasers and is "tailored" to meet the needs of the individual buyer. Pricing data is always kept up to date by the issuance of new price supplements.

Bound books are suitable for use of the majority of motor and control buyers. They contain prices (correct at time of issue and satisfactory for estimating purposes throughout the books' life), dimensions, application data and descriptions. Books include:

"Motor Buying Data" covering popular types and ratings of motors (up to 100 hp), Gearmotors and M-G sets.

"Control Buying Data" listing a wide variety of controllers and accessories for direct current, single-phase, squirrel-cage, wound rotor motors.

J 90499

HERE'S HOW TO GET THIS NEW BUYING DATA

If you are a buyer of Motors and Control, chances are you have already received this new data by mail.

However, if you have not received your copy, write, wire or phone your nearest Westinghouse district office (requests will be filled through district offices only—no mailings from Westinghouse Headquarters at East Pittsburgh). Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

BIG

little things with

JOBS

Ultra smoothness and extreme accuracy in the mechanical world mean more efficient operation, more dependability, longer life.

It is the *forte* of honing and superfinish stones to create ultra smoothness and extreme accuracy; to create those physical attributes far beyond the capacity of anything else man has yet contrived.

MID-WEST MICRO BOND honing and superfinish stones have blazed many new trails in the field of superb finishes and extremely close tolerances. Many of Uncle Sam's weapons of war—tanks, guns and planes—owe a portion of their deadly efficiency to a MID-WEST honing or superfinish stone often smaller than a match. Truly such tiny items are little things with big jobs!

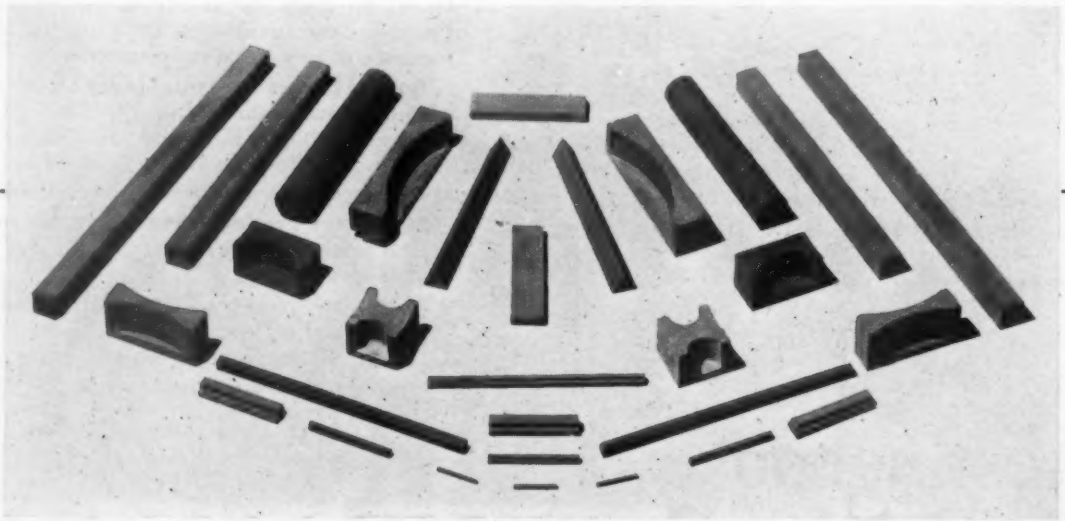
MID-WEST honing and superfinish stones—*the world's most efficient abrasives*—come in any size, any shape, any grain, any grade. They last longer, cut faster and produce smoother surfaces with less heat.

MID-WEST ABRASIVE COMPANY

Manufacturers of DEPENDABLE Abrasives

1960 E. Milwaukee Avenue **Detroit 11, Michigan**

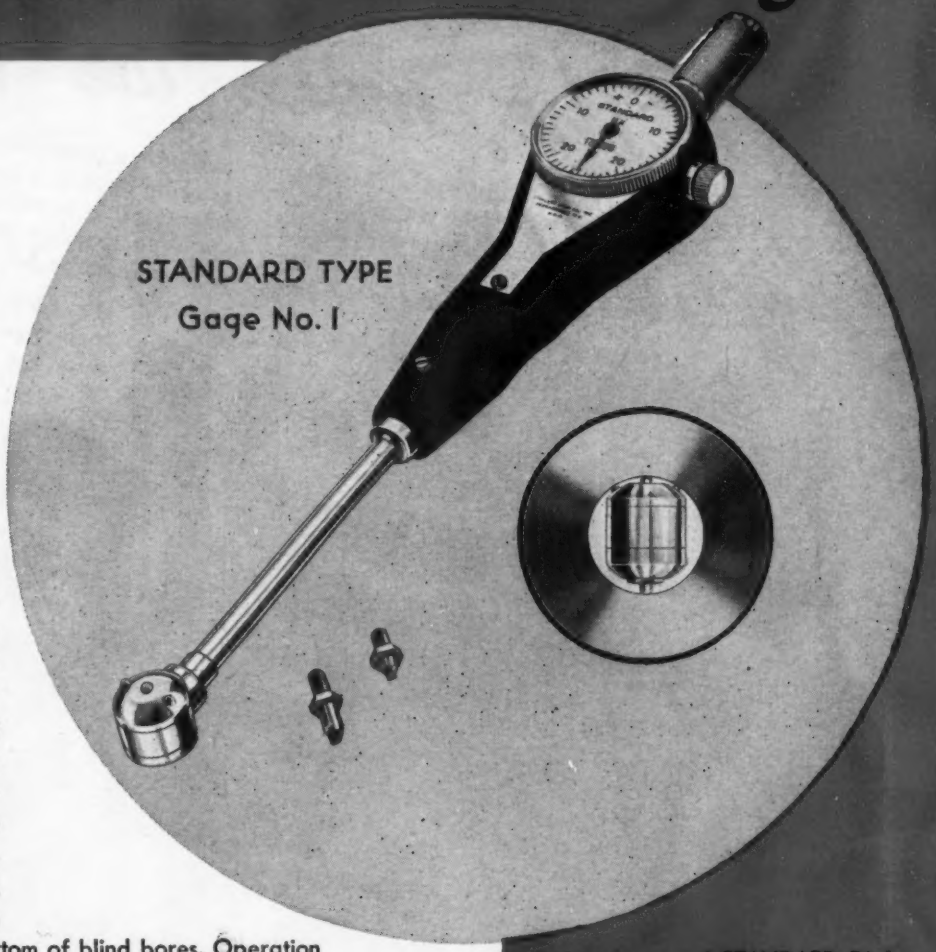
MID-WEST'S complete line of abrasive products also includes grinding wheels for any purpose, coated abrasives of any type and compounds. Let a MID-WEST service engineer tell you what MID-WEST abrasives have done for others. You'll be amazed!



A NEW STANDARD Dial Bore Gage

for measurements ranging from 5/8" to 1" with UX Indicator graduated in .0001"

Fast, Light, Accurate...



HERE'S the newest addition to the STANDARD family of Dial Bore Gages. A small, lightweight, fast, close-tolerance checking instrument for small bores comparable in accuracy with the larger size dial bore gages.

Utilizing the same centralizing principle of other STANDARD Dial Bore Gages, it is only necessary to insert the gage, and rock handle slightly. Minimum reading on indicator shows exact diameter. Even holes with obstructions such as shoulders, webs, undercuts, etc., can be measured because this Dial Bore Gage can measure within ¼" from the bottom of blind bores. Operation is reduced to a minimum; accuracy and precision assured; and the range of workability is considerably increased as a result of improved design.

Other Dial Bore Gages with measuring range to 12⅛" completely illustrated and detailed in our new No. 10 Catalog. Send for it.

New, improved STANDARD Dial Bore Gage with diameter extensions furnished with each gage. Cross section shows gage in use.

STANDARD *Dial Snap Gage*

Combines Snap Gage Speed with Comparator Precision

STANDARD Dial Snap Gages combine PORTABILITY with speed in use and absolute accuracy on dimensions as fine as .0001". Adjustable gaging pin has a serrated flat surface tipped with tungsten carbide that practically defies wear. Opposite movable pin has mushroom top, also tungsten carbide. Point-and-plane construction assures continued, accurate readings whether instrument is set by cylindrical or flat standards.

16 Stock Sizes cover Range 0" to 8". Each can be set to measure any dimension within a range of ½". Sizes measuring up to 4" designed as at right. Sizes 4" to 8", because of larger size, are made with convenient finger hole grip for greater ease in handling.

Write for Special Bulletin on STANDARD Dial Snap Gages.

STANDARD GAGE CO., Inc., Poughkeepsie, N.Y.

The more we Produce . .

The Bullard Vertical Turret Lathe had won a prominent place in hundreds of American plants long before the war placed new demands upon it. It has no equal for precision work on heavy parts of a variety of equipment indispensable to war on land, on sea, and in the air. Its two heads holding several cutting tools work together to finish several operations in markedly lower time than competitive methods can hope for.

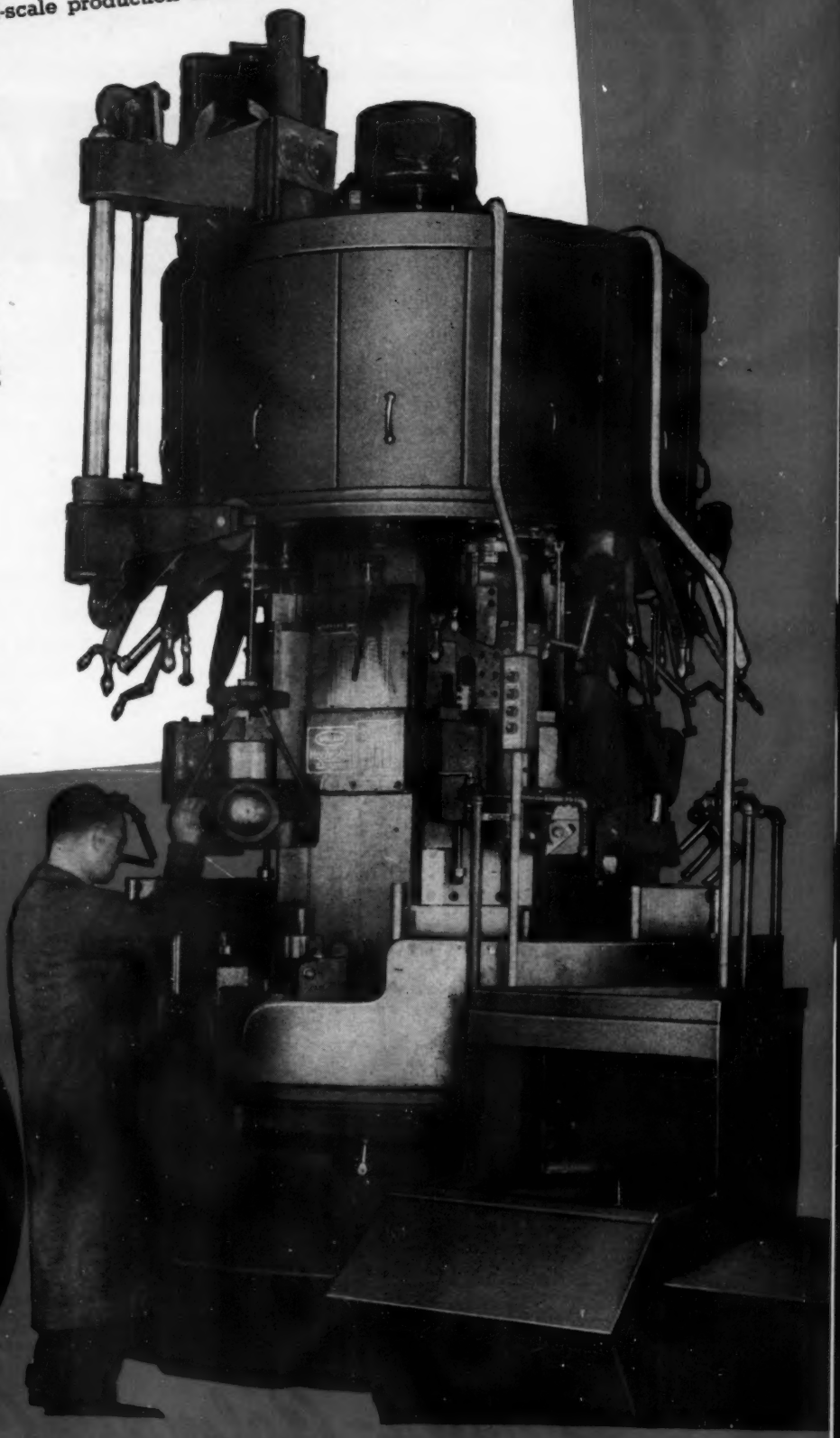
An additional advantage of Bullard machines is their ready adaptability. They are helping to pro duce the volume of war material by which alone the war can be won. And whe the boys come marching hom both the Mult-Au-Matic and t Vertical Turret Lathe will need l a short time for reto ing, to start rolling the host of new p ucts to fill, at lowe costs, the huge mands of the pe time world.

Battery of Bullard Vertical Turret Lathes machining crankcase for radial air-cooled diesel engines. Spiral Drive Vertical Turret Lathes are built in 24", 36" 42" and 54" table sizes. Also Cu Master Vertical Turret Lathes in 54", 64" and 74" size with two or three heads.

THE BULLARD C

THE SOONER WE'LL WIN

One of the striking developments, as America's war machine goes into high, is the widespread entrance of the Mult-Au-Matic in fields which before the war were thought to be largely the province of small-scale production to extremely fine limits. In building airplane engines, for instance, the Mult-Au-Matic has proved its ability to handle scores of individual jobs... with no sacrifice in precision, and with the tremendous increase in volume long familiar to America's mass production industries. On many operations the Mult-Au-Matic method cuts machining time to a small fraction of the old-fashioned single-spindle method. On hundreds of production lines today, even though the ranks of skilled workmen are being thinned...Mult-Au-Matics are helping FEWER men to produce MORE work.



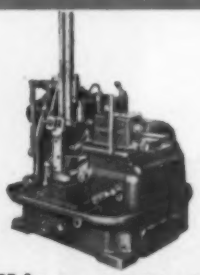
One of the big Type D "16-23" 8-Spindle Mult-Au-Matics machining barrels for airplane propellers. This larger Bullard is built to handle heavier work — note the hydraulic hoist mechanism for easy chucking.

COMPANY BRIDGEPORT 2 CONNECTICUT

HOBS • HOBBING MACHINES • HOB SHARPENING MACHINES • MILLING CUTTERS

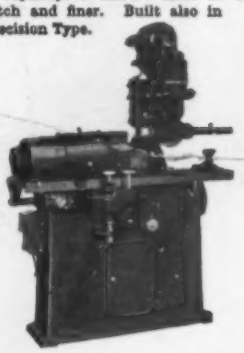
BARBER-COLMAN

REAMERS • REAMER SHARPENING MACHINES • SPECIAL TOOLS

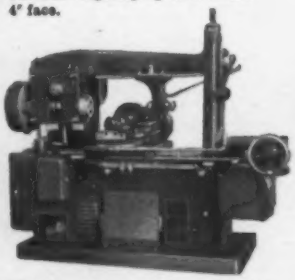


TYPE S Automatic Hobbing Machine — For production of small precision gears up to 1" diameter x ½" face and 200 D.P.

No. 3 Standard Hobbing Machine. — Capacity: 5" dia. x 7" face. 12 Pitch and finer. Built also in Precision Type.



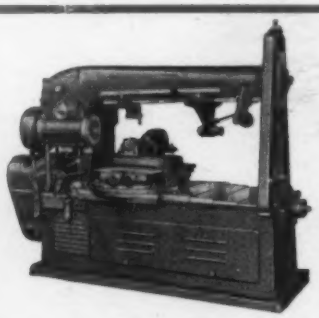
No. 3 Automatic Hob Sharpening Machine for hobs and formed cutters. Capacity up to 4" dia. x 4" face.



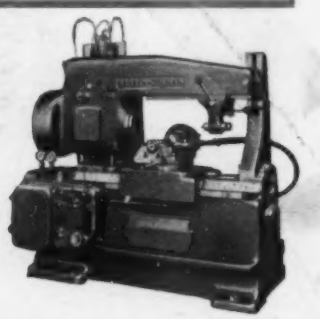
TYPE A Hobbing Machine — A rigid, accurate machine for general purpose or production hobbing. Capacity: 12" dia. x 12" face. 4 Pitch and finer.

. . . "SOMETHING MORE" FOR '44

For thirty-five years our Machine and Small Tool Divisions have specialized in the manufacture of high quality production machines, cutting tools, and allied equipment for hobbing, milling, and reaming. The broad experience we have gained in this work has enabled us to solve many difficult problems for our customers. Now . . . as the "something more" which we offer for 1944 . . . we are providing an *extension of our Engineering Service.* By making our experience more easily available to you, we expect to help you in two ways. First, you can be sure you are operating your Barber-Colman machines and cutting tools so as to achieve best possible production and accuracy with longest possible life. Second, you can be sure of a source for sound, practical advice on the many knotty how-shall-we-do-it problems arising from today's demands for greater precision, greater production, or both. Consult Barber-Colman Engineering Service . . . it is ready to serve you even more in '44.



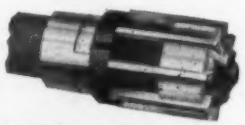
TYPE T Taper Spline Hobbing Machine — May be used also on general hobbing work within its capacity. Spur and spiral gears, straight and involute splines, etc., may be hobbed.



TYPE D Hobbing Machine — A heavy duty high production machine powered hydraulically. Capacity: 14" dia. x 14" face. 3 Pitch and finer.

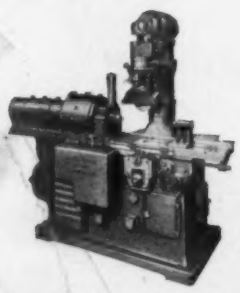
HOBS—Ground and Unground, Standard and Special.

MILLING CUTTERS —"Paraform" Design; Formed, Standard and Special



REAMERS—Fluted, Inserted Blade, and "Pinwedge" Expansible Reamers.

COMBINATION Sharpening Machine — Sharpens hobs, cutters and reamers; straight gashed up to 24" stroke; or maximum 30° helix with 8" stroke.



No. 4 Automatic Hob Sharpening Machine for hobs and formed cutters. Capacity up to 10" dia x 12" face.

Barber-Colman Company

GENERAL OFFICES AND PLANT 111 LOOMIS ST., ROCKFORD, ILLINOIS, U. S. A.

Inspection Arms! by SLOCOMB

SLOCOMB MICROMETERS *help speed munitions production . . . by insuring accuracy and high quality work*

Accepted for over 50 years as the standard for precision measuring, SLOCOMB MICROMETERS are today helping attain the difficult production goals toward which war-busy munitions plants are working.

In spite of more exacting tolerances calling for closer inspection, speed and accuracy in measuring and checking through the use of SLOCOMB MICROMETERS are helping make more war materials available to our armed forces in shortest possible time. Rejections are minimized.

The 112 page No. 18 Slocomb Catalog describes the SLOCOMB line and the features of SLOCOMB MICROMETERS which contribute to their convenience and long-lived accuracy under constant, hard, exacting service. Write for your copy today.

SLOCOMB MICROMETERS ARE USED ALL OVER THE WORLD

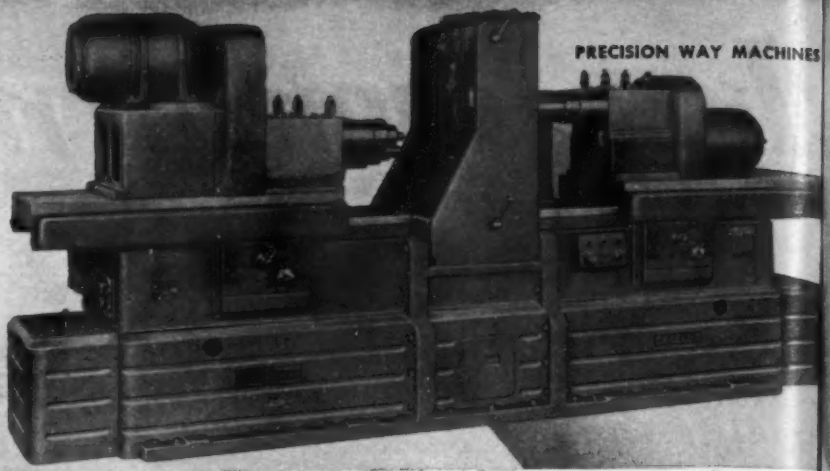
J. T. SLOCOMB COMPANY PROVIDENCE, R. I.

NEW YORK • CHICAGO • CLEVELAND • DETROIT

SAN FRANCISCO • LOS ANGELES • SEATTLE • DENVER • SYRACUSE

PRECISION BORING MACHINES

PRECISION WAY MACHINES

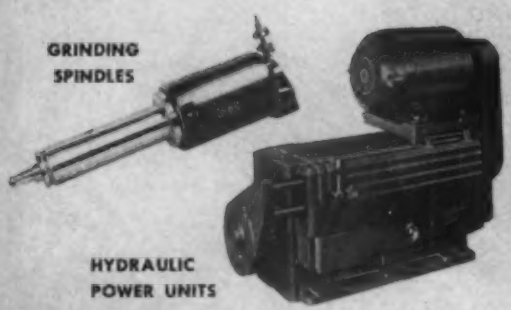


PRECISION THREAD GRINDERS

SPECIAL MACHINES

GRINDING SPINDLES

HYDRAULIC POWER UNITS



PRECISION BORING MACHINES

Nine standard styles for boring, turning and facing to extremely close uniform limits with high finish. Hydraulically or manually operated fixtures designed for each job. Machines can be set up for a wide variety of work. Of sturdy construction, they are built for speed and accuracy and simplicity in operation.

PRECISION THREAD GRINDERS

For higher production, greater accuracy and more economy in producing threaded work, Ex-Cell-O precision thread grinders are now universally used by modern industry. Nine standard styles—for external and internal threads—cover the field of today's production requirements.

SPECIAL MACHINES

Ex-Cell-O Angular-type Cylinder Boring machine with six individually adjustable spindles . . . one of many machines designed and built by Ex-Cell-O for specific requirements; often performing numerous operations in one setting and assuring substantial savings in production costs.

GRINDING SPINDLES

Ex-Cell-O manufactures precision ball-bearing spindles for internal, surface and universal grinding machines—as original equipment and as replacement.

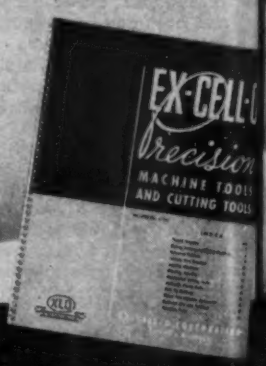
HYDRAULIC POWER UNITS

Left: Provide economical method of drilling, reaming, countersinking and spot-facing—these operations in multiple if desired. Units may be used as prime movers or drivers for other machine units.

PRECISION WAY MACHINES

Ex-Cell-O Precision Way Machines are designed to perform boring, turning and facing operations faster and more accurately —IN ONE SET-UP. One or more fixtures, operated manually or automatically, may be used for simultaneous or progressive operations. The bolted construction feature permits substituting different center sections.

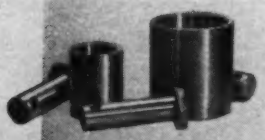
Below: Ex-Cell-O's new catalog on precision machine tools, cutting tools, and other Ex-Cell-O precision products. Contains illustrations, descriptions, and specifications. A copy will be mailed free to any request on business letterhead. Ask for Ex-Cell-O Catalog No. 27121.

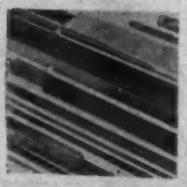


SPECIAL MULTIPLE PRECISION DRILLING MACHINES • GRINDING SPINDLES
PURE-PAK® CONTAINER MACHINES • PRECISION PARTS • BROACHES
HYDRAULIC POWER UNITS • R. R. PINS AND BUSHINGS • TOOL GRINDERS

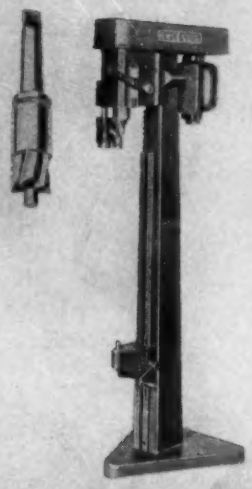
DRILL JIG BUSHINGS

R. R. PINS AND BUSHINGS





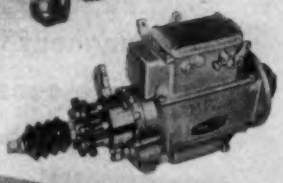
CONTINENTAL CUTTING TOOLS



CENTER LAPPING MACHINES

CARBIDE TOOL GRINDERS

INTERNAL LAPPING MACHINES



DIESEL FUEL INJECTION EQUIPMENT

DRILL JIG BUSHINGS

A. S. A. Standard bushings made by Ex-Cell-O assure absolute uniformity, easy replacement, long life. Available in wide range of styles and sizes. Large stock carried, making prompt delivery possible on most orders.

R.R. PINS AND BUSHINGS

Ex-Cell-O hardened and ground steel bushings and pins are used by more than 125 American railroads. Precision finish assures longer wear, improved performance, greater dependability.

CONTINENTAL CUTTING TOOLS

These include broaches, ground form tools, counterbores and counterbore sets (with Continental's indestructible drive), inserted-blade milling cutters and also wide range of carbide tipped tools.

For Accuracy, Speed and Economy In Production

EX-CELL-O precision-made machine tools and equipment are making worthwhile improvements in today's methods to attain mass production with the utmost in accuracy and economy. All EX-CELL-O machine tools do precision work . . . they are purposely designed and built that way. It's now common practice through the metal-working industry to use EX-CELL-O as another word for *precision.* Take the machine tools shown here. They are performing a wide variety of machining operations in many American plants, where tolerances are extremely close and the highest production is essential. Their flexibility in use, their compact construction, their smooth and easily-controlled operation, their great strength and extreme rigidity . . . these are features that make EX-CELL-O standard and special machine tools a favorite with both owners and operators where accuracy, speed, economy, and simplicity in operation are required.

EX-CELL-O CORPORATION • DETROIT 6, MICH.

CENTER LAPPING MACHINES

Designed to correct distortion from heat treating and the inaccuracies of rough centers, thus permitting closer tolerances of modern commercial grinding requirements.

CARBIDE TOOL GRINDERS

Ex-Cell-O Style 44 Precision Carbide Tool Grinder (one of six Ex-Cell-O styles) for finish grinding all types of boring, facing and turning tools on a high production basis.

INTERNAL LAPPING MACHINES

For rapid precision finishing of small holes, eliminating difficult grinding and expensive finishing operations. Design of lapping stone and mandrel assemblies enables interrupted holes to be precision lapped.

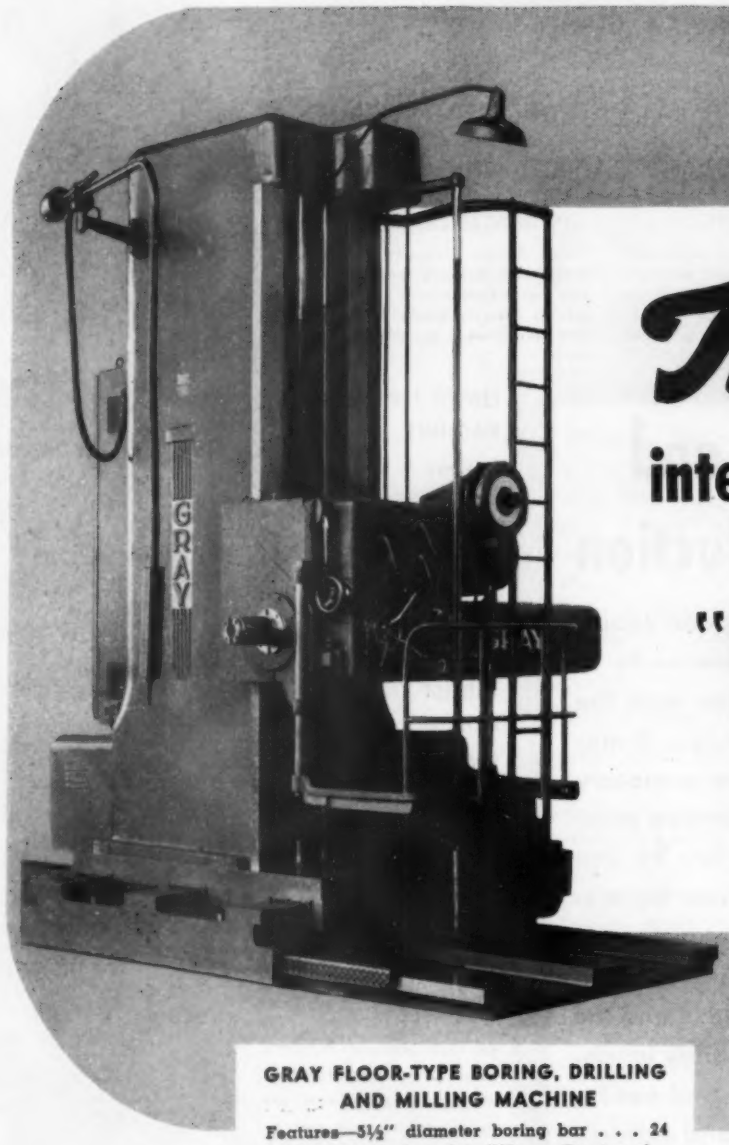
DIESEL FUEL INJECTION EQUIPMENT

Ex-Cell-O Diesel Fuel Injection Equipment is made for installation by Diesel engine builders (marine, industrial, and automotive). Both Ex-Cell-O Pump and Ex-Cell-O Nozzle are built to high precision standards, the result of years of experience in the Diesel fuel injection field.

XLO

EX-CELL-O *for* PRECISION

PRECISION THREAD GRINDING, BORING AND LAPPING MACHINES • SPECIAL MULTIPLE WAY-TYPE PRECISION BORING MACHINES • DRILL JIG BUSHINGS CONTINENTAL CUTTING TOOLS • DIESEL FUEL INJECTION EQUIPMENT



The GRAY

interprets modern machine tool design in "MAXIMUM SERVICE"

Double Housing Planers
Open Side Planers
Milling Machines
Boring, Drilling and Milling Machines of the Floor Type

GRAY FLOOR-TYPE BORING, DRILLING AND MILLING MACHINE

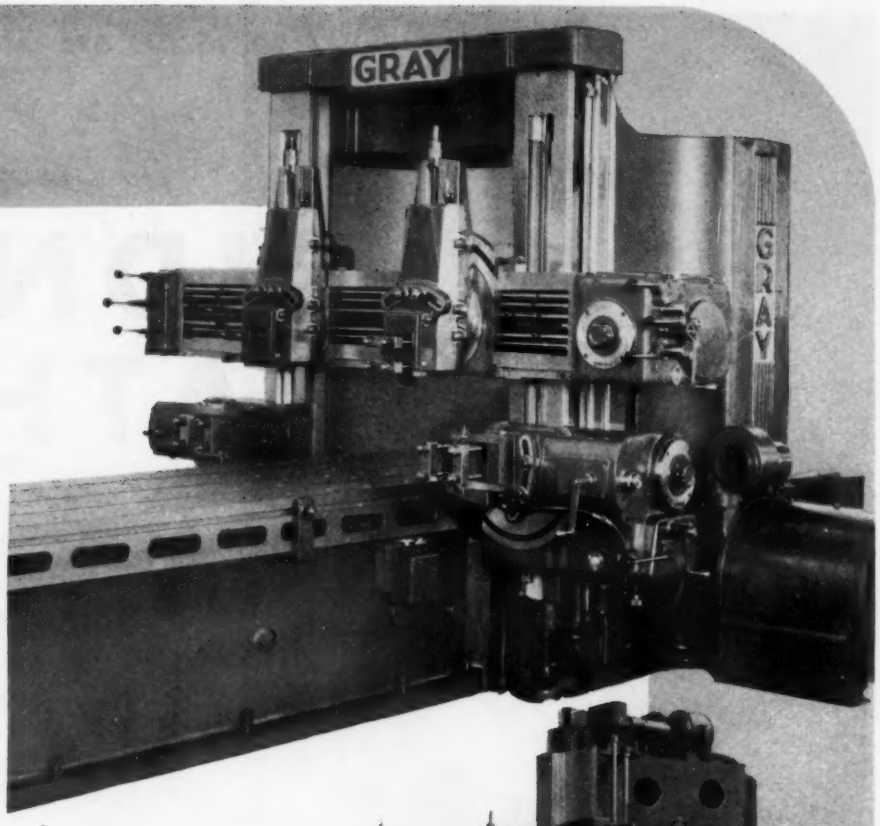
Features—3½" diameter boring bar . . . 24 spindle speeds from 3 to 550 . . . Bar travel—48" (standard) but can be increased to 72" . . . Column travel—6 ft. (standard) but can be increased to 20 feet . . . Vertical travel of head on column—72" (standard) but can be increased to 96" . . . Can be furnished with 18" or 24" cross traverse of column . . . Weight, standard machine, without floor plate 51,000 pounds.

GRAY MILLING MACHINES

Here's a few of the 25 exclusive features insuring Speed . . . Rigidity . . . Convenience—Gray Stub-Shaft Spiral Geared Drive, gives enduring smoothness of motion with minimum torsional wind-up and is self locking under all conditions . . . Bed construction, made possible by the type of table drive, adds tremendously to its rigidity . . . Table Control permits rapid traversing, engaging feed, or inching table in either direction from either side of bed . . . Insto-Shift Speed Change enables operator to instantly obtain desired spindle speed without even stopping the motor. Built in a range of sizes from 36" to 84" between cutters and any length working surface from 8 feet to 40 feet.

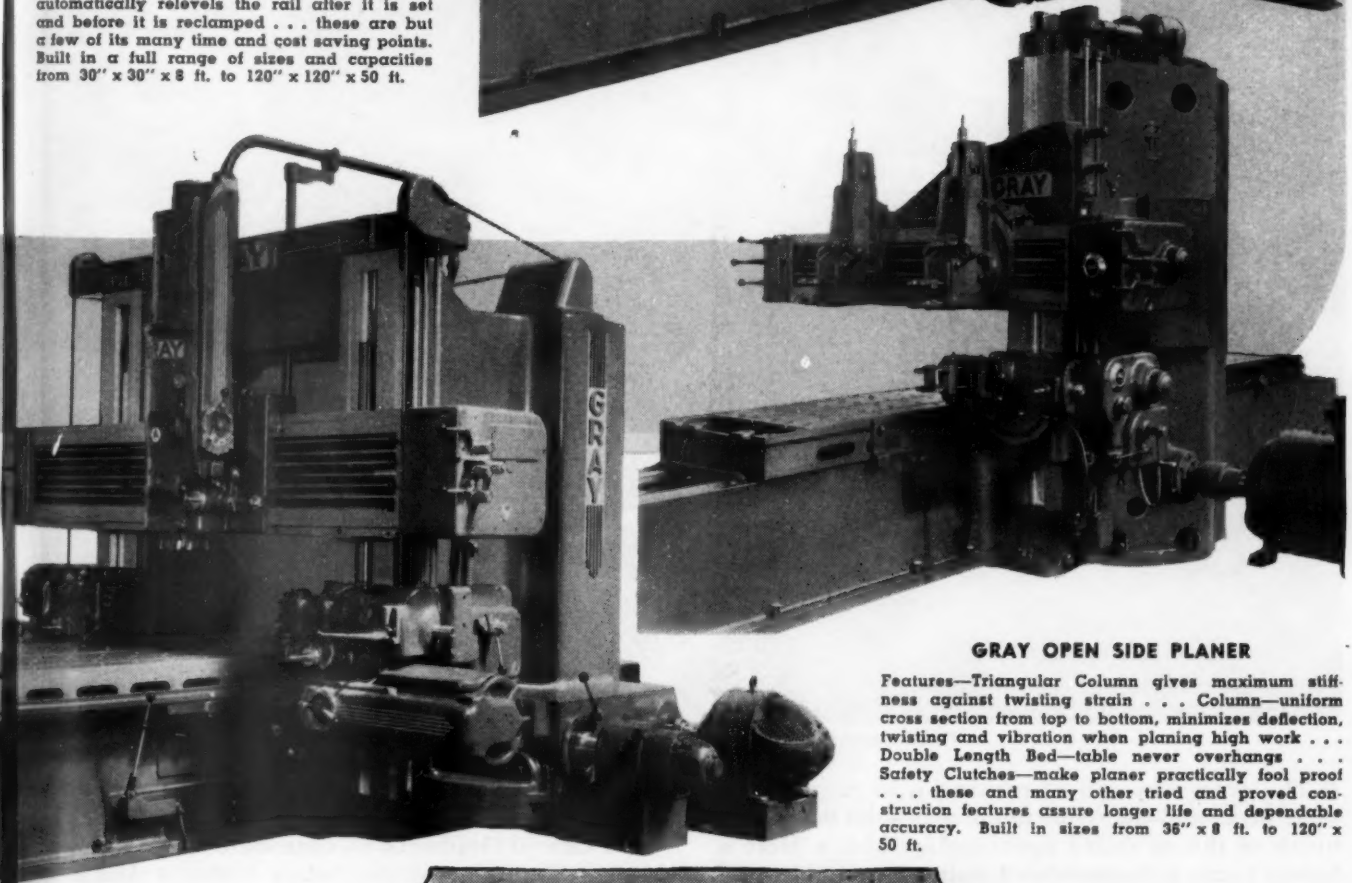
● Throughout the Gray line, strength and rigidity is expressed in massive construction. However, the design is such that all of the machines are exceptionally simple and easy to handle, thus permitting maximum production without fatigue. In these days of high production and in the days to come when costs will play an important part in the selection of machine tools, it will pay you to consult Gray on the wide range of operations covered by the Gray line.

Line



GRAY DOUBLE HOUSING PLANER

Features—Balanced Helical Gearing for power and enduring smoothness of motion, Cantslip Dial Feed not only a Dial Feed, but a Positive Feed, instantly set . . . Single-Shift Rapid Power Traverse one motion gives rapid movement of any head . . . Tool Point Control Feed and rapid traverse of either rail head can be controlled at the head itself, as well as from both ends of the rail . . . Gray Rail Setter you can set the rail without moving from operating position . . . Automatic Rail Leveling automatically relevels the rail after it is set and before it is reclamped . . . these are but a few of its many time and cost saving points. Built in a full range of sizes and capacities from 30" x 30" x 8 ft. to 120" x 120" x 50 ft.



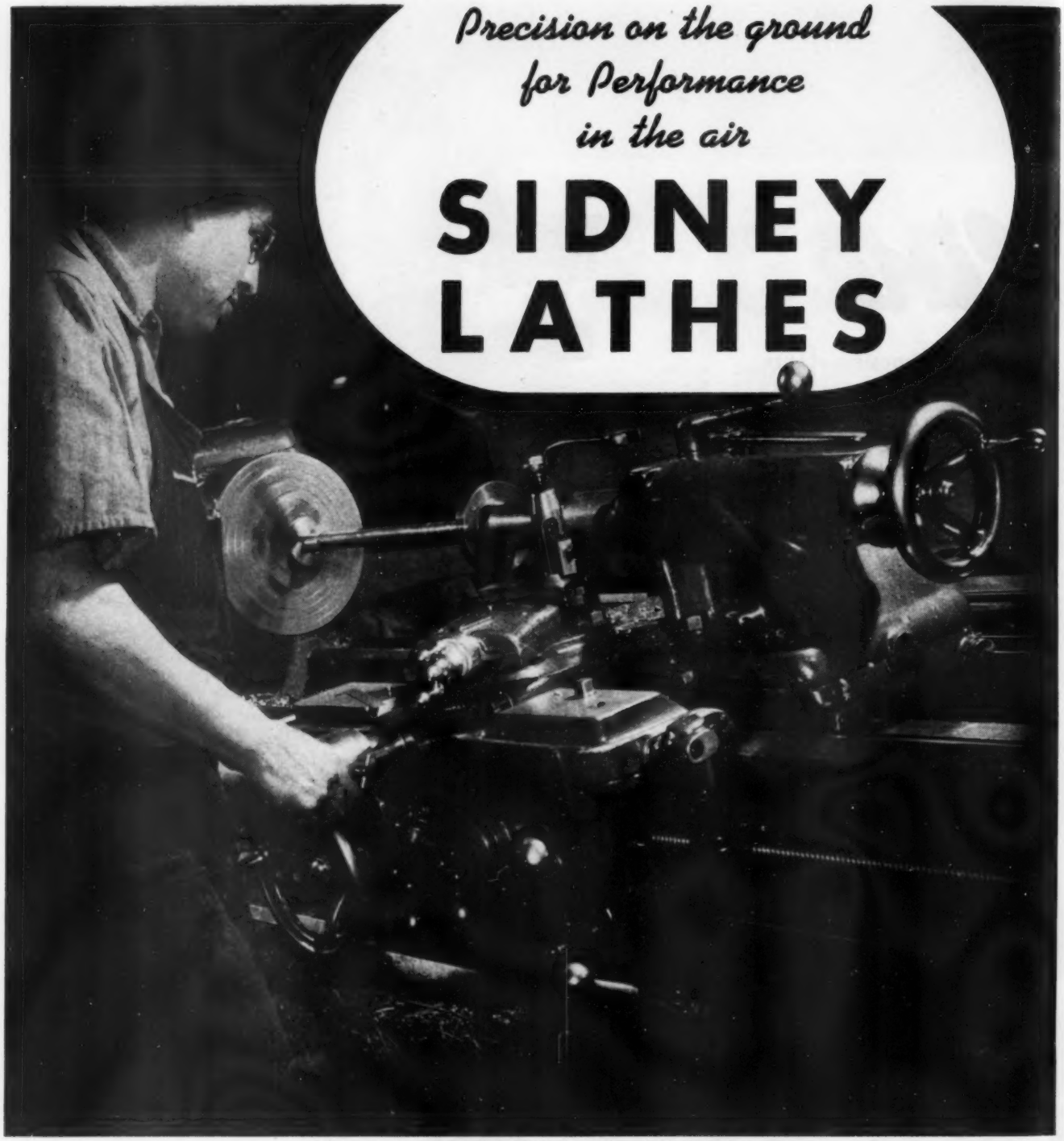
GRAY OPEN SIDE PLANER

Features—Triangular Column gives maximum stiffness against twisting strain . . . Column—uniform cross section from top to bottom, minimizes deflection, twisting and vibration when planing high work . . . Double Length Bed—table never overhangs . . . Safety Clutches—make planer practically fool proof . . . these and many other tried and proved construction features assure longer life and dependable accuracy. Built in sizes from 36" x 8 ft. to 120" x 50 ft.

GRAY

THE G. A. GRAY COMPANY
Cincinnati, Ohio, U.S.A.

THE GRAY LINE — Double Housing and Openside Planers, Switch Planers, Die Block Planers, Double-Housing and Openside Milling Planers, Planer Type Milling Machines, Horizontal Boring Machines.



Precision on the ground for Performance in the air

SIDNEY LATHES

Photo Courtesy Consolidated Vultee Aircraft Corporation

● The every day run of turning jobs require the same precision—the same uniformity—the same high finish as the so called spectacular jobs. • Here a Sidney Lathe at Consolidated Vultee is meeting precision tolerances on a turning operation quickly — easily. • The convenience of controls at normal working position—the wide selection of feeds and speeds instantly available — the smooth flow of power from the continuous tooth Herringbone Geared Headstock all contribute to the accuracy and productivity of this Sidney Lathe. • And it is these Sidney Lathe qualities that make them so popular in the Aircraft Industry.

Bulletins on all sizes available.

SIDNEY

The SIDNEY MACHINE TOOL Company

Builders of Precision Machinery

SIDNEY ESTABLISHED 1904 OHIO

This improved cutting oil

gives longer tool life

and better finishes on nonferrous metals—

GULF CUT-AID

This revolutionary Gulf Cutting Oil is setting new standards of machine tool performance in hundreds of plants

Gulf Cut-Aid *consistently* shows better results in cutting aluminum and other nonferrous metals!

Here's a typical case:

Operation—machining forged aluminum fuse bodies for high explosive shells.

Result with Gulf Cut-Aid—increased production, longer tool life, and much better finish.

In addition to its superior performance in cutting nonferrous metals, Gulf Cut-Aid has another important function—it is an effective energizer for other cutting oils, regardless of type or viscosity. Blended in varying proportions depending upon the various requirements of the job, the use of Gulf Cut-Aid with other cutting oils makes possible higher production speeds and results in improved finish, longer tool life, or both.

Call in a Gulf Service Engineer today and let him show you how Gulf Cut-Aid and other Gulf quality cutting oils can help improve *your* machining practice.

GULF OIL CORPORATION
GULF REFINING COMPANY
GULF BUILDING, PITTSBURGH, PA.

TOOLS ARE WEAPONS...
TREAT 'EM RIGHT

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation—Gulf Refining Company AM
3800 Gulf Building, Pittsburgh (30), Pa.

Please send me, without obligation, a copy of the booklet, "Gulf Cutting Oils," which includes a 45-page Machining Guide.

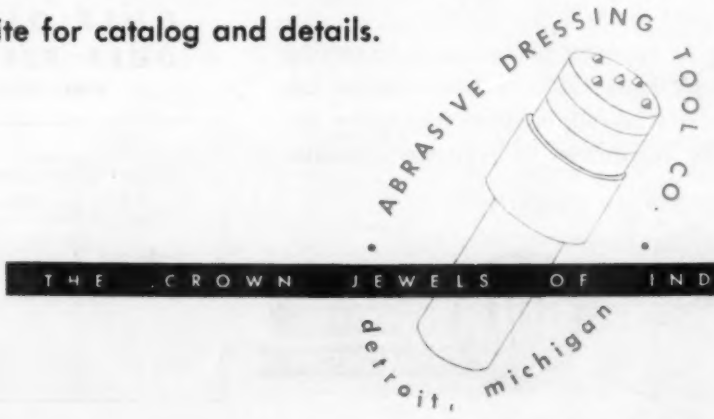
Company_____

Name_____

Title_____

Address_____

Sure, Tony, it's a tough grind... but it's a tougher grind for all the men responsible for grinding-wheel performance. Those men will tell you why they prefer Abrasive RED BAND diamond dressing tools. In addition to three generations of diamond experience, Abrasive alone offers the engineering triumph, the "Oxide-Free Process" which fuses diamonds and powdered metal so miraculously that even the final fraction of each stone wears out in *useful service* . . . providing *better* work, *more* work per set-up. Write for catalog and details.



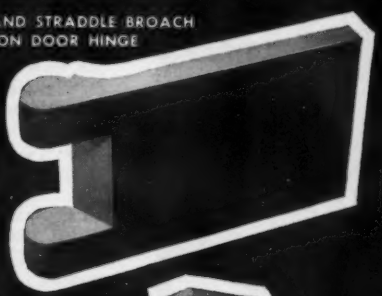
SURFACE BROACHING

IN THE AUTOMOTIVE INDUSTRY

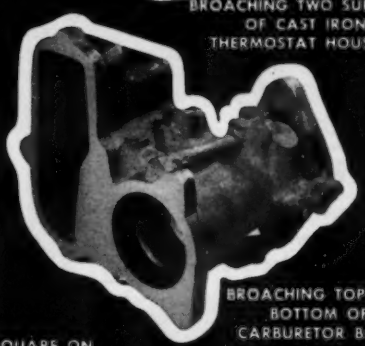
TEN TON 54" STROKE DUPLEX SURFACE BROACHING MACHINE

BROACHING TWO SURFACES OF CAST IRON THERMOSTAT HOUSING

TEETH OF BEVELED GEAR ROUGHED BY BROACHING

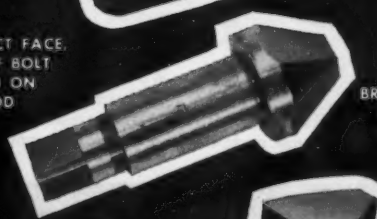


SLOT AND STRADDLE BROACH ON DOOR HINGE



BROACHING TOP AND BOTTOM OF CARBURETOR BODY

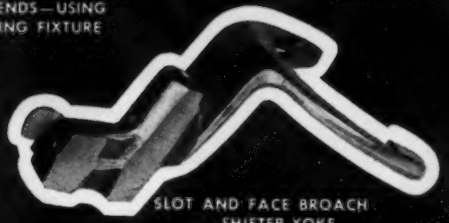
HALF ROUND, CONTACT FACE, SIDES AND BACK OF BOLT BOSSES, BROACHED ON CONNECTING ROD



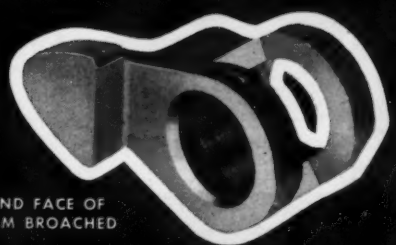
BROACHING SQUARE ON BOTH ENDS—USING INDEXING FIXTURE

STRADDLE AND FACE BROACH STEERING SPINDLE

BROACHED CONTACT SURFACES OF MAIN BEARING



SLOT AND FACE BROACH SHIFTER YOKE



SLOT AND FACE OF STEEL CAM BROACHED

★ In the automotive field surface broaching is providing a means of producing many car, truck, tank, and combat vehicle parts faster, more accurately and at a lower cost than would be possible with any other machining method. Now while every penny saved means a lower war cost and in the days to come when keen competition will make savings on every part essential it will pay you to investigate the advantages of surface broaching. Send drawings and production requirements for an analysis of its possibilities on your work.

THE FOOTE-BURT COMPANY • **Cleveland 8, Ohio**

Detroit Office: General Motors Building

MOVE UP THE SCHEDULE ☆ WIN THE WAR QUICKER

FOOTBURT

Surface

BROACHING

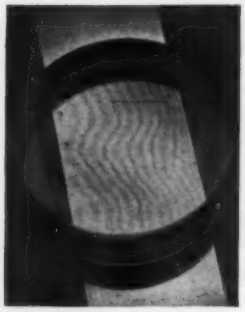
Van Keuren

. . . HEADQUARTERS FOR P

Announcing

THE NEW LIGHT WAVE EQUIPMENT

for checking costly gages and precision lapped parts.



Revealing worn spot .000023" deep on amplifying gage anvil

In 1920, The Van Keuren Co. pioneered the use of optical flats for measurements with light waves. We now present the New Light Wave Equipment with double surface optical flats made of pure fused quartz.

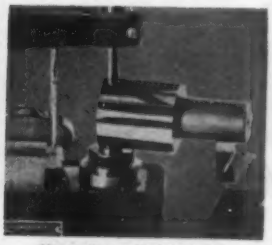
Temperature changes affect quartz flats very little (1/16 as much as plate glass, 1/6 as much as pyrex). They will wear 10 times as long as ordinary flats. They are the most economical to purchase and the most accurate to use.

Use the new Van Keuren Light Wave Equipment for measuring the flatness of precision lapped parts, for amplifying gage and instrument maintenance and for the control of wear on gage blocks.

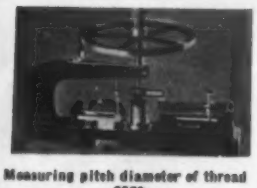
Complete equipment which includes monochromatic light source, working flats, and master flats

LIGHT WAVE MICROMETERS

Provide accurate measurements without using gage blocks.



Measuring cylindrical plug gage



Measuring pitch diameter of thread gage

Readings may be duplicated to an accuracy of .00001" or .00002" by different operators without the use of gage blocks. The Light Wave principle applied in the Van Keuren Micrometer enables readings to be made at the same pressure and eliminates errors of feel or touch. This instrument is recommended for checking measuring wires, plug gages and small precision parts, also any parts made of soft material where a light measuring pressure must be applied.

Full information on Van Keuren precision measuring tools is given in our new Catalog and Handbook No. 32, just off the press.

This is a 144 page book, containing complete tables, data and formulae for measuring threads, gears, gages and precision parts.

Write for your cop

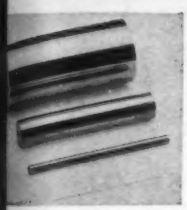
THE ★ Van Keuren COMPANY 176 WALTHAM ST.

R PRECISION MEASUREMENTS

THREAD MEASURING WIRES

tandard Equipment for measuring thread gages, taps and worms.

Measuring pitch diameter of thread gage with Van Keuren "Best Size" Measuring Wires.



Large and Small Measuring Wires

Manufactured to National Bureau of Standard specifications. Hardened, ground and lapped. Standard thread sizes accurate within .00002" for roundness and straightness and within ± .000025" for size.

Stock sizes available for measuring U.S. Standard, Whitworth, Metric, British Association, Pipe, Acme and 29° Worm Threads. Specials available on order, from .002" diameter to 1.5708" diameter.

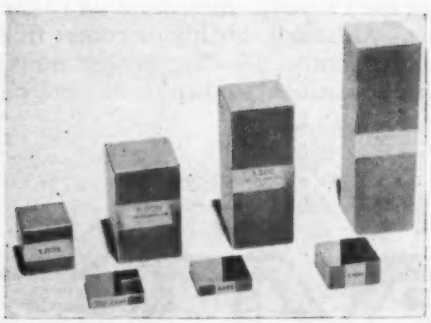
GEAR MEASURING WIRES

e simplified Van Keuren gear measring system provides a more accurate eans of obtaining pitch diameter and oth thickness measurements. Complete bles are furnished giving the measement over the wires for 1 diametral tch. The only calculation required is e of simple division. The system is sed on formulae approved by the merican Gear Manufacturers Associaon. Van Keuren Gear Wires are acrate within 25 millionths inch for undness and size.

Van Keuren No. 26 External Gear Measuring Wire set includes 26 sizes from 2 to 80 DP.

Announcing

SOLID SQUARE MASTER BLOCKS



Van Keuren Solid Square Master Blocks are a new product. They represent a new design, new value, and new utility. They are the result of 25 years of experience in the manufacture of precision gage blocks, and flat optical surfaces on steel, glass and other materials.

Solid Square Master blocks are made to 4 millionths accuracy. They will wear 6 times as long as ordinary gage blocks.

Use Van Keuren Solid Square Master blocks for permanent accuracy.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages Wire Type Plug Gages • Measuring Wires Thread Measuring Wires • Gear Measuring System • Shop Triangles.

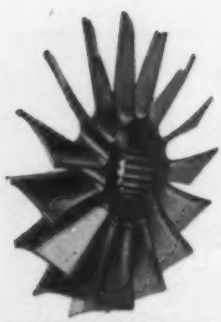
ST. WATERTOWN, MASS.

"We could not, in honesty, acknowledge our pride on this occasion without paying a special and public tribute to our fellow employees. To a very major degree, this widely coveted and proudly possessed award now flies above the DeVlieg plant because of their loyalty, their devotion to the job at hand and to their uninterrupted effort. Although this honor comes from past achievement, it is proper to say here that another DeVlieg project now nearing completion will make possible another sensational step-up in the performance of still another type aviation engine."

Chas. B. DeVlieg. H. R. DeVlieg E. R. DeVlieg

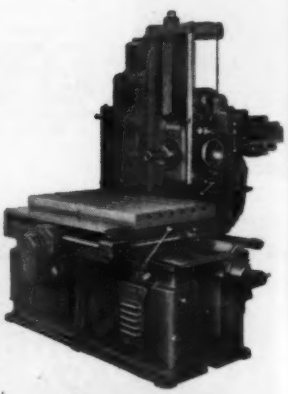
DEVLIEG

FERNDALE - - - MICHIGAN



SUPERCHARGER INDUCER BY DE VLIEG

The acceptance of the DeVlieg art by industrial America was originally based on the superiority of DeVlieg milling methods, and the "E" award was conferred for a revolutionary application of these basic methods. This new application involved the development of the process and the machines by which is being produced the inducer portion of *ALL* the superchargers of the Allison and Rolls Royce aviation engines. As a result of this one application of the DeVlieg art, both of these famous engines demonstrate importantly increased performance. At the same time, the inducers themselves are being produced at *FIVE PER CENT* of their original cost with a reduction in required machine tool investment of *NINETY PER CENT!* Today what formerly was a complex manufacturing operation calling for the highest type of veteran craftsmanship is now capable of being performed by women.

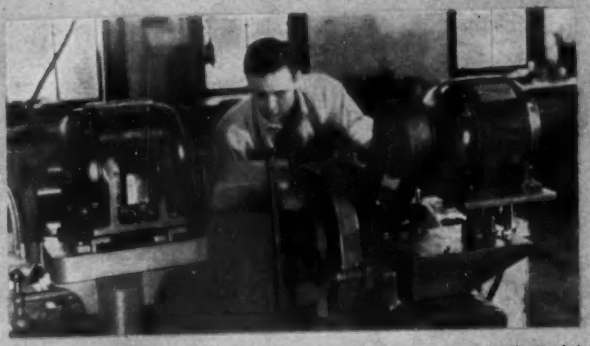


JIGMIL BY DE VLIEG

SHORTS STYMIED

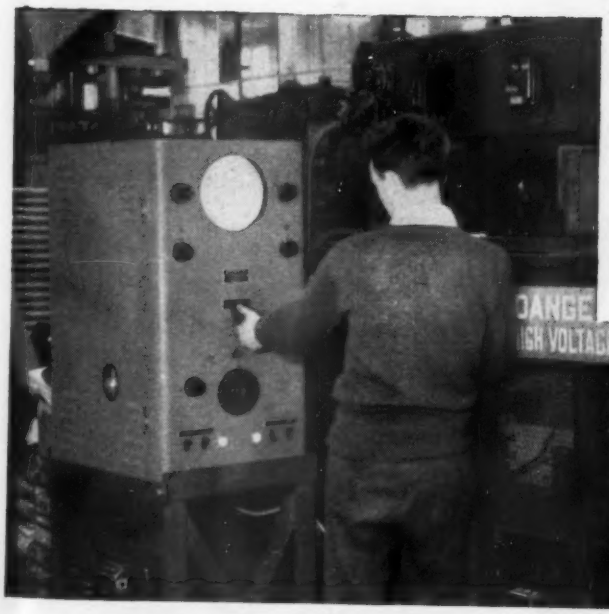
Voltage surges which accompany switching and frequent starting and stopping of motors impose high dielectric stresses on the coil insulation, and can cause harmful short circuits. Yet this is an unavoidable condition of service for many motors.

The grinder shown here, for example, starts and stops every time a finished part is removed and a new part inserted. But the two Tri-Clad motors that drive it have been built to withstand safely the voltage surges ordinarily encountered in this type of service. Their ability to "stymie" shorts was proved by *the new General Electric test* described below.

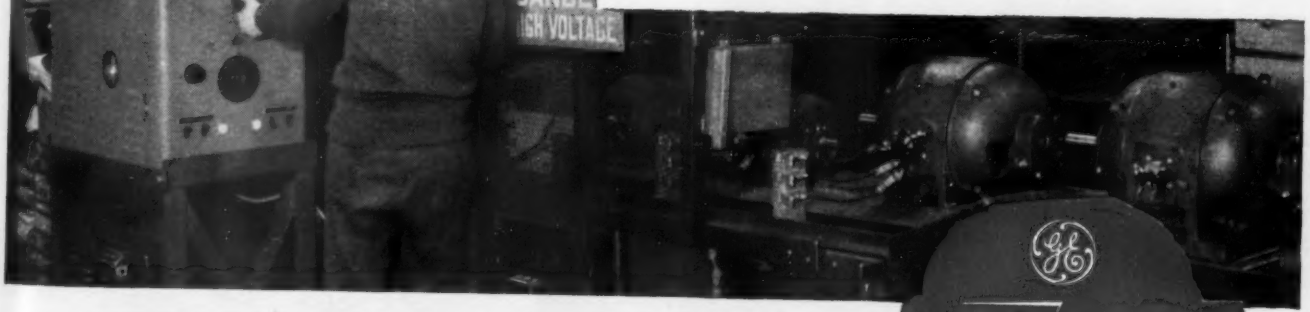


External grinder, equipped with two Tri-Clad motors, installed in the milk-machinery manufacturing plant of the Rite-Way Products Company, Chicago, Ill.

New high-potential, electronic surge-tester verifies strength of TRI CLAD motor windings



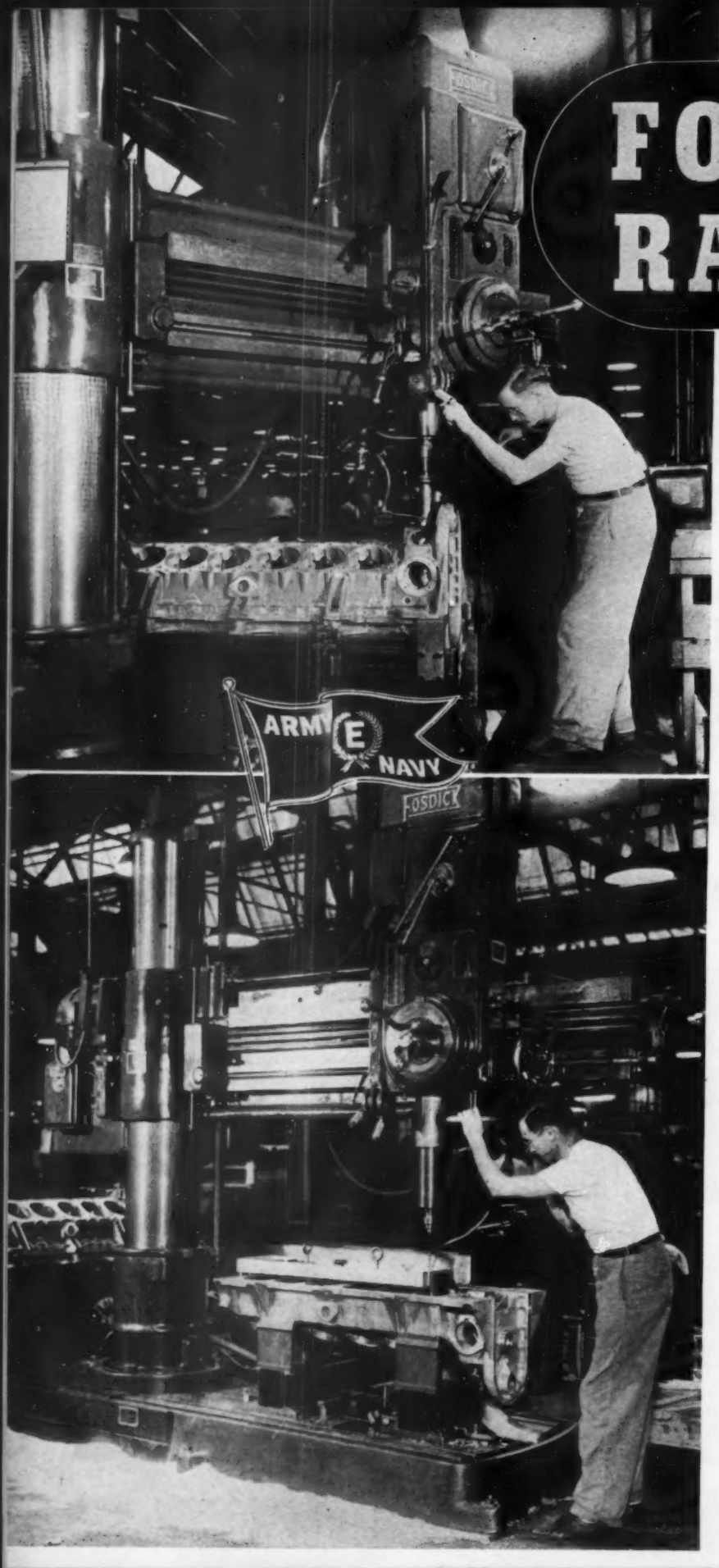
This electronic test of insulation makes a "cardiogram" of every Tri-Clad motor winding, ferreting out weaknesses that might lead to shorts caused by voltage surges in service. It tests each turn, coil, and phase group of the windings for adequate insulation strength to withstand the "steep front" high-voltage surges of actual service. First developed and applied by G.E., it's one of the production tests which all Tri-Clad motors must pass as they come off our production lines. – *General Electric Company, Schenectady, N. Y.*



GENERAL ELECTRIC

TRI CLAD MOTORS

Each week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.



FOSDICK RADIALS

FORM IMPORTANT LINK IN PRODUCTION CHAIN.

● Today hundreds of Fosdick Radials are performing a wide range of drilling, boring, tapping and similar operations in a host of shops producing vital war equipment.

Tomorrow this versatility — rigidity — and ease of operation will permit them to continue their important functions in industry on jobs on which costs are the all important item. Illustrated are two Fosdick Radials, one boring — the other drilling holes in motor castings at the Graham-Paige plant.

If you have a job that can be done on a Radial — put it on a Fosdick for accuracy — for speed — for low cost production.

The Fosdick Radial Drill Bulletin RA gives complete information. Want one? Write today on your company letterhead.

FOSDICK MACHINE TOOL COMPANY
CINCINNATI 23, ··· OHIO

They laughed when I asked for a left handed monkey wrench!

1 **"Listen,"** I said, "*I* know they don't make left-handed monkey wrenches or left-handed soldering irons! They didn't make *me* left-handed either. But the way you have this light fixed, I've got to either use my left hand or work in my own shadow!"

2 **"Hmmm!"** hmms the foreman. "Maybe you got something!" He calls the superintendent, and the first thing I knew the electrician had moved a couple of light fixtures. And what a difference! Next day they were checking up on the lights all over the place. I think I deserve a medal—or something!

3 **Simple changes** like this have speeded production and improved morale in many a war plant. Changes that eliminate *glare* or *shadows*—or *gloom* from dust and grease on lighting equipment, walls and ceilings. For lighting help, call your local electric service company, your G-E lamp supplier or your nearest G-E Lamp Office.

GENERAL ELECTRIC LAMP RESEARCH is responsible for much of the good lighting that is speeding war production today. The never-ending goal of that great research organization is to make General Electric lamps *stay brighter longer.*

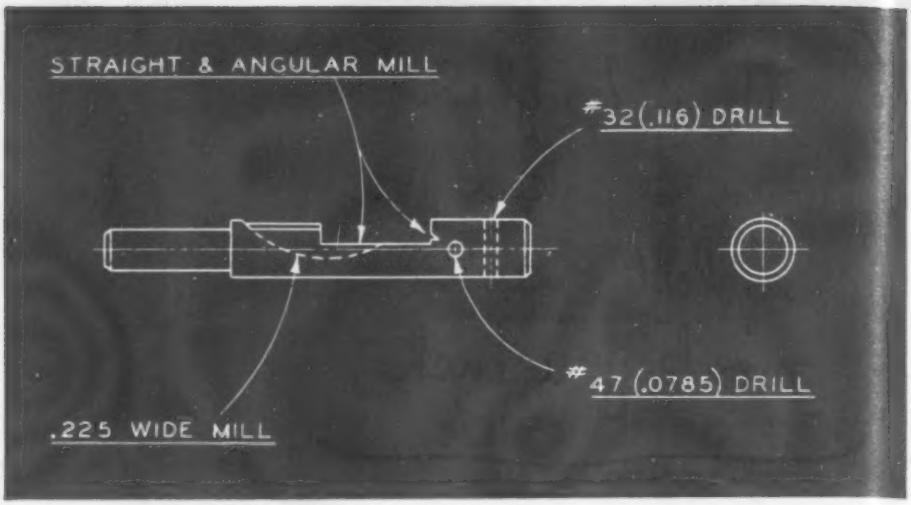
"TO MAKE LAMPS STAY BRIGHTER LONGER"
The Creed of G-E RESEARCH

THE BEST INVESTMENT IN THE WORLD IS IN THIS COUNTRY'S FUTURE...BUY WAR BONDS

G-E MAZDA LAMPS

GENERAL ELECTRIC

Hear the General Electric radio programs: "The G-E All-Girl Orchestra," Sunday 10 p. m. EWT, NBC; "The World Today" news every weekday, 6:45 p. m. EWT, CBS.



THIS IS A

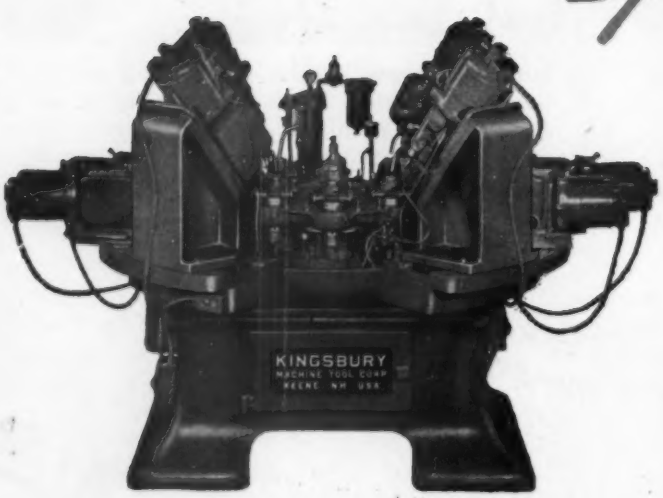
FLEXIMATIC

SMALL ARMS JOB!

Turning out rifle bolts to exact specifications under a fast production schedule

FLEXIMATIC

by KINGSBURY



Many vital needs of armament production are being met with FLEXIMATICS—the machines which perform a wide variety of machining operations in a single chucking of the work.

The Model GD FLEXIMATIC shown here performs various drilling and milling operations on rifle bolts—a job that calls for the highest in both precision and production.

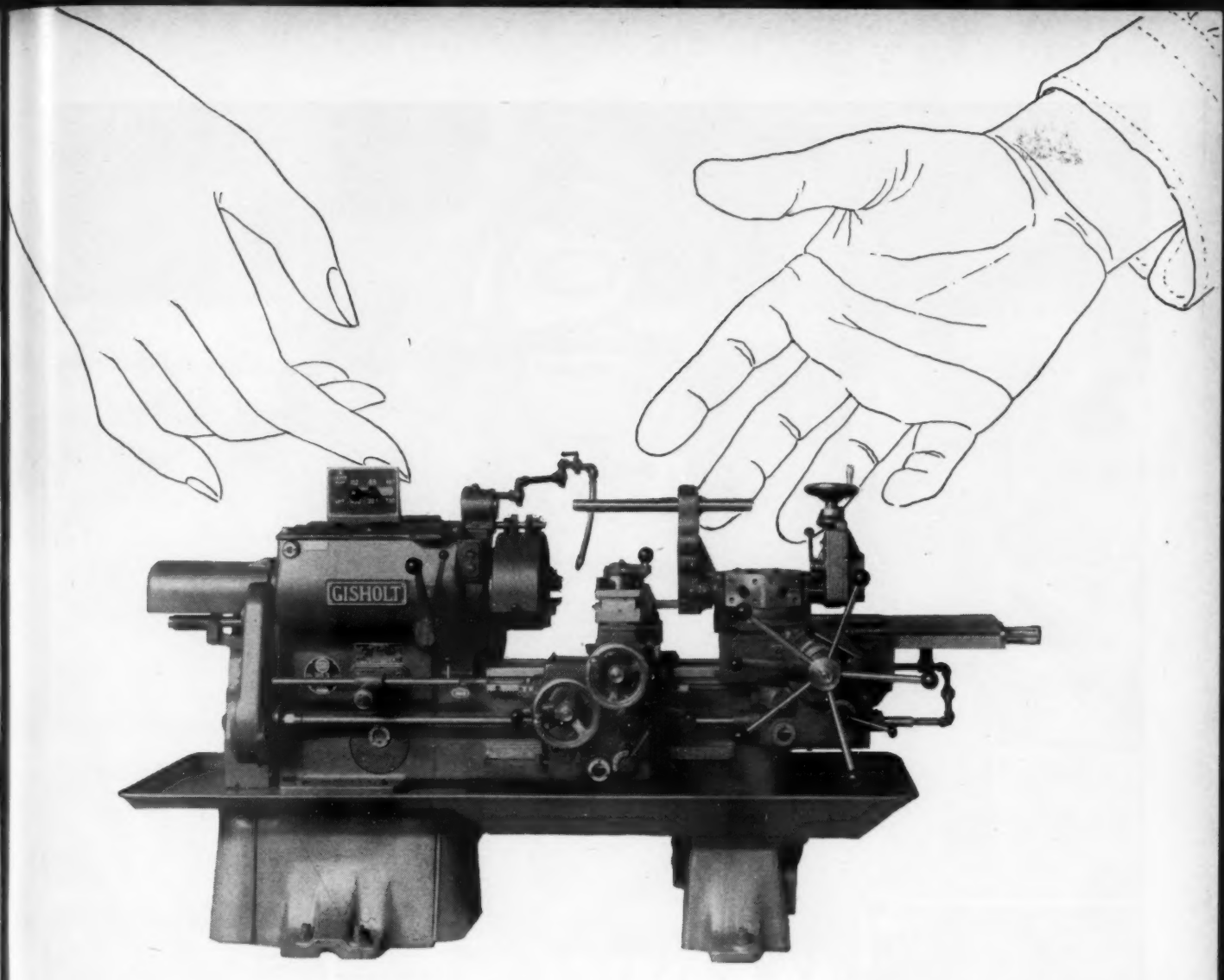
Contributing to the accuracy of the operations performed on this FLEXIMATIC is the mounting of milling spindles on Timken precision bearings. Further safeguarding of accuracy is achieved through driving each spindle by a cone worm and worm gear and dampening vibration by means of a heavy fly-wheel.

FLEXIMATICS are ideal for all classes of armament production where high accuracy and fast production with unskilled labor are every day conditions which must be met. FLEXIMATICS can, therefore, be depended on to make outstanding production contributions to National Defense.

Write today for illustrated Bulletin showing a number of different set-ups.

KINGSBURY MACHINE TOOL CORPORATION

KEENE, NEW HAMPSHIRE, U.S.A.



This Postwar Improvement Couldn't Wait

Hydraulic Clutching and Braking. With this new Gisholt improvement comes ease in starting, stopping and reversing the spindle. It puts an end to tugging at levers, to fatigue. The only physical effort required to engage clutches is a mere flick of the hand on the hydraulic control—to right or left. In neutral position, automatic spindle braking brings the work to a quick, smooth stop.

Why save an important improvement like this for postwar announcement? It's needed *now* to speed up war production. It's available *now,* as standard equipment, on all Gisholt Ram Type Turret Lathes. If you'd like more detailed information, write us.

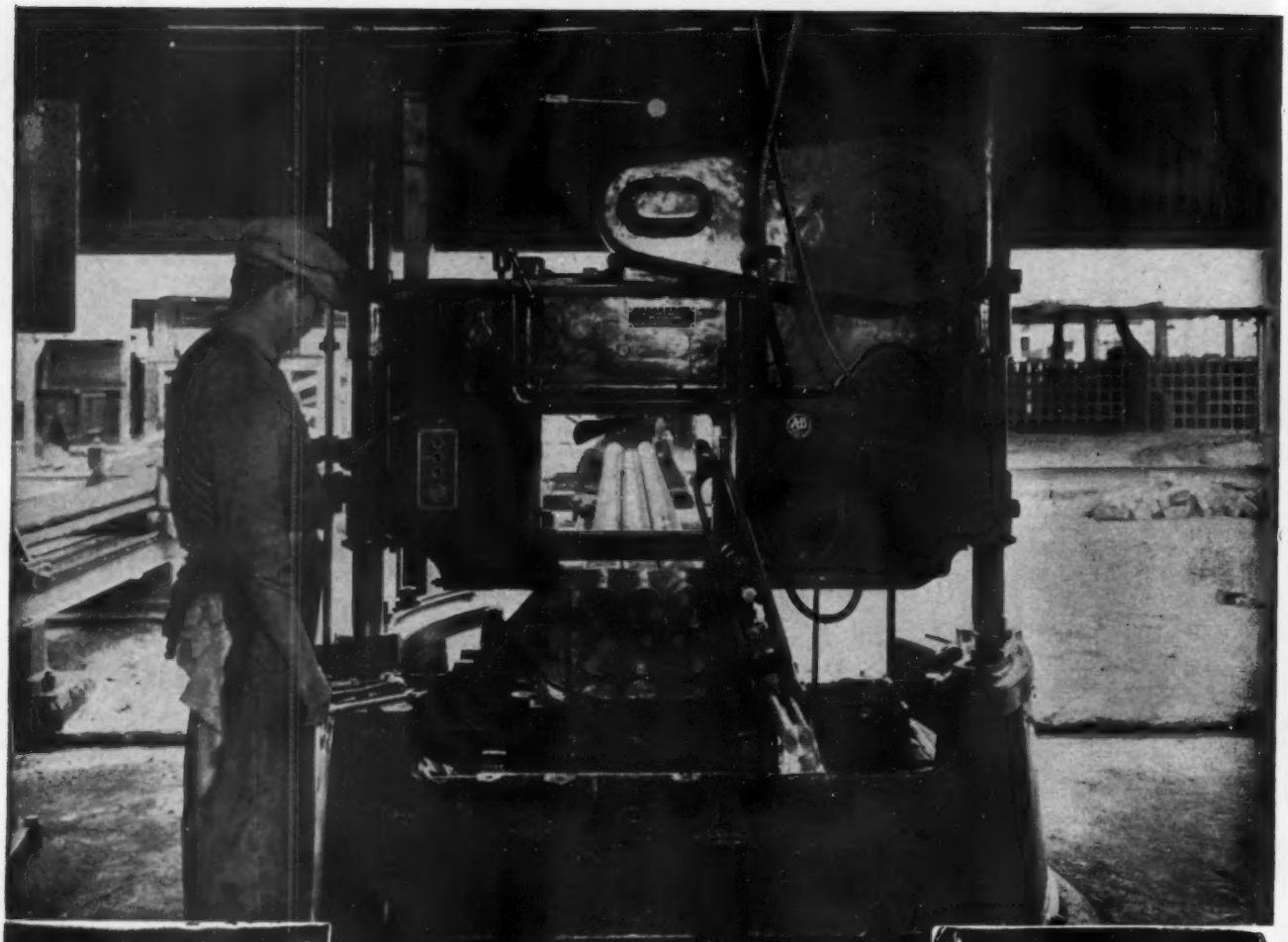
GISHOLT MACHINE COMPANY

1201 East Washington Avenue • Madison, Wisconsin

GISHOLT

...Look Ahead...Keep Ahead...With Gisholt

RRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SPECIAL MACHINES



MARVEL SAWS

Cut anything that will go between the jaws

This is one of five No. 18 MARVEL Giant Hydraulic Hack Saws used by a well known Texas tool company to cut-off "multiple bars of alloy steel in round, square, and flat shapes, up to the maximum capacity of the large work-throat (18" x 18").

These super hack saws are designed for the largest sizes, and toughest steels—up to 18" x 18". After a year's heavy duty service, when asked as to the effectiveness of these saws in solving the cutting-off problems at this plant, the mechanical engineer in charge reported them "very effective."

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave. Chicago, U. S. A.
Eastern Sales Office: 225 Lafayette St., New York

Where reverses bring success . . .

Rapid reversals for various motions on modern high-speed machine tools provide the opportunity to decrease machining times. Multiplied by the number of reversals per work cycle and the number of cycles per day, these operations add up to a sizeable number of man-hours. In a postwar competitive market, the savings on time can mean the difference between success and failure.

Regardless of the application—lathe—drilling and tapping machine—multiple spindle drill—there is a Westinghouse A-C reversing drive to fit the job. Successful installations, proved in use, include lathe drives capable of reversing 15 to 25 times a minute and drills, 14 to 60 times a minute.

For example, one machine tool builder uses a Westinghouse multiple-speed motor rated at 3/2/1-1/2/1 hp, 3600/1800/1200/600 rpm, and providing 6, 14, 24 and 60 reversals per minute for these speeds, respectively.

The determination of the proper rating and size of motor for a specific machine tool application is but one of the many problems of machinery electrification for which Westinghouse can supply you the proper answer. This ability to provide simple electrical solutions to complex mechanical problems is yours for the asking. Just call your nearest local office. Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

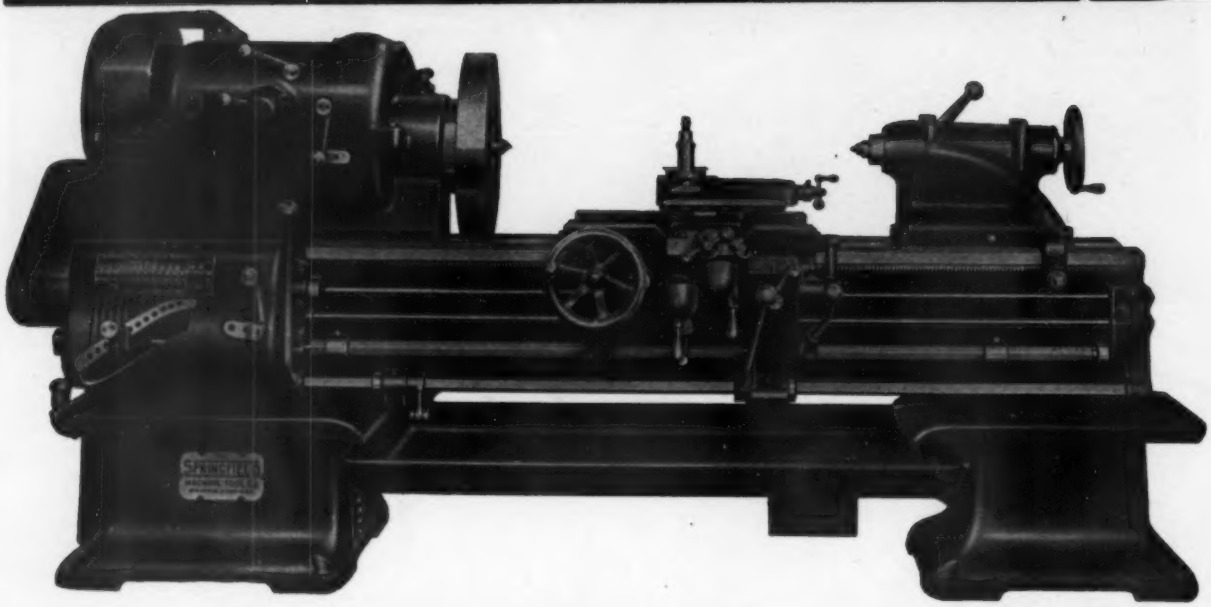
J-94619

Westinghouse

PLANTS IN 25 CITIES OFFICES EVERYWHERE

THE MACHINE IN MACHINE TOOLS

Choose SPRINGFIELD



GEARED HEAD LATHES

In this respect you'll find it to your advantage to choose SPRINGFIELD Geared Head Lathes.

From the ground up, a SPRINGFIELD Lathe represents superior construction and design. All heavy castings, including the bed, are cast in our own shop . . . gearing is designed for maximum efficiency . . . attachments demonstrate unusual engineering ingenuity . . . lubricating systems and power transmission are built to take it, 24 hours a day. In fact, to fully understand what SPRINGFIELDS can do for you, check their superior metal turning records in other shops . . . and judge for yourself.

Under current emergency conditions make it SPRINGFIELD Geared Head Lathes . . . they'll do your job better, now and later, tool Sizes range from 14" to 30". Write concerning deliveries, prices, etc.

The SPRINGFIELD MACHINE TOOL Co.

SPRINGFIELD OHIO U.S.A.

Union TOOLS

FOR WAR JOBS THAT MUST BE *Right!*

Tough jobs, "fussy" jobs, unusual jobs of war production — Union will take them all on and produce results that meet today's urgent demands for speed, accuracy and tool economy. Tools for war production must be chosen with care. Try UNION Tools on the war jobs that must be RIGHT — and we're sure they'll become the Tools You Buy Again for every job.

UNION TWIST DRILL CO.
ATHOL, MASS.

S. W. Card Mfg. Co. Div., Mansfield, Mass.
Butterfield Div., Derby Line, Vt.
Butterfield Div., Rock Island, Quebec.

STORES

New York: 61 Reade St.
Chicago: 11 So. Clinton St.
Detroit: 6540 Antoine St.
San Francisco: 121 Second St.
Los Angeles: 524 E. Fourth St.
Seattle: 568 First Ave., South.

Divisions of the UNION TWIST DRILL CO.

UNION BUTTERFIELD CARD

CARD

Meets Today's Challenge of Production

No need to tell you that present production demands require the best in service and accuracy from every tool.

To get highest quality results from Card Taps, take advantage of Card Service . . . We will analyze your threading jobs from every angle and recommend the best procedure and the proper tap for every job.

Quality Taps plus Complete Service — a combination that goes a long way towards meeting today's challenge of production!

Divisions of the UNION TWIST DRILL CO.

S. W. CARD MFG. CO.
MANSFIELD, MASS.

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New York: 61 Reade St.
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UNION BUTTERFIELD CAR

FOR A LONG LIFE OF PRECISION

Today, small tools must **last!** Tried under rigorous conditions of aircraft manufacture, tested in all branches of munitions work, Butterfield Taps and Reamers are proving their accuracy — their **long lasting** accuracy. Under some of the toughest conditions ever encountered in metal-working, Butterfields have lived up to every claim we make for them. Choose them for your precision wartime threading jobs.

Butterfield

TAPS and REAMERS

BUTTERFIELD DIVISION

DERBY LINE, VT. **ROCK ISLAND, QUE.**

STORES: New York, 61 Reade St. Chicago, 11 So. Clinton St. Cleveland, Hal. W. Reynolds, 3346 Superior Ave. Detroit, 6540 Antoine St. Los Angeles, 524 E. Fourth St. Toronto, 137 Wellington St., West. Montreal, 111 St. Paul St., West. Winnipeg, 403 Travellers Bldg. Vancouver, 327 Shelly Bldg. Agents for Great Britain—Charles Churchill & Co., Ltd., 27-34 Walnut Tree Walk; Kennington, London, S. E. 11, England. Branches at Birmingham, Manchester, Glasgow, Newcastle-on-Tyne and Bristol.

Divisions of the

UNION TWIST DRILL CO.

UNION BUTTERFIELD CARD

RIGHT FROM THE PAGES OF THIS TOOL STEEL MANUAL

You can find ways to . . .
INCREASE PLANT OUTPUT
REDUCE COSTLY MACHINE SHUT-DOWNS
SIMPLIFY HEAT TREATING

● **This Manual contains an 80-page *Tool Index and Steel Selector*, alphabetically arranged, to help you quickly find the correct tool steel for each job.**

Idle machines and presses—waiting for tools that must be repaired, reground or replaced—*can* be kept working more hours per month. And the Carpenter *Matched Tool Steel Manual* can help you keep them on the job.

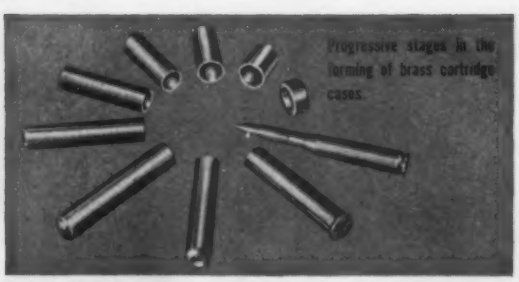
In thousands of plants, this Manual is helping to eliminate costly machine shut-downs. And its simplified heat treating instructions protect the many valuable hours that go into the making of tools.

The Carpenter *Matched Set Method* of selecting tool steel is not "just a fancy name". Ask any Tool Room Foreman who has used it . . . and note the *typical* results shown here.

It's easy to cash in on the advantages of the *Matched Set Method*. Just drop us a note on your company letterhead and we'll start your copy of the Carpenter *Matched Tool Steel Manual* on its way. And, of course, when you need personal help with a special tool steel problem, your nearby Carpenter representative will be glad to put his diversified experience to work for you.

The Carpenter Steel Company • 109 W. Bern St., Reading, Pa.

How This Method Works on a Multiple-Tool Job . . .



◆ Tools used for the first trimming cut. The Matched Set Diagram pointed the way to the correct tool steel in each case. Carpenter *Matched* Tool Steels were used throughout, and some of the tools are shown here.

◆ Pocketing punch, pocketing punch die and eject stem—each made for a specific job, and each made from a different Carpenter *Matched* Tool Steel.

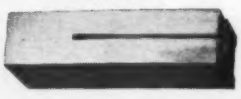
FOLLOW THE ARROWS ON THE MATCHED SET DIAGRAM

The Standard Tool Steels of Industry

These Three Plants Used the Matched Set Method

...And Look At The Results They Got!

1



THE TOOL: A striking die for stamping gold-filled spectacle temples.

THE PROBLEM: When made from a straight carbon tool steel, the die would break after about 14,000 pieces.

THE SOLUTION: The Tool Engineer saw that *greater toughness* was needed, so he checked the *Matched Set Diagram* and found that *Solar* would probably give best results.

With *Solar*, output per tool jumped from 14,000 to 100,000 pieces!

2

THE TOOL: A draw die for drawing bearing retainers from plain hot rolled steel ⅛" thick.

THE PROBLEM: After about 4,000 pieces, the die had to be replaced because of oversize wear. Replacing the worn die consumed 1 hour, during which the press was idle.

THE SOLUTION: Going to the top of the *Matched Set Diagram* for *greater wear resistance*, they selected *K-W* tool steel and got these results:

1. Tool life increased from 4,000 to 86,000 pieces.
2. Press shut-down time was reduced by 42 hours a month, which meant 52,500 pieces *extra output* per month.

3

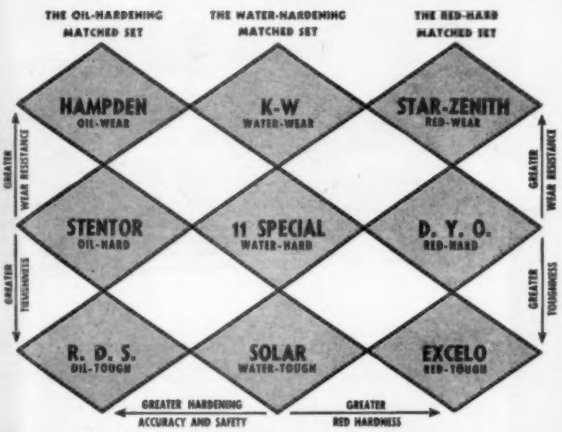
THE TOOL: A coining punch for forming bearing races from 1015 steel. Production speed of 16,000 pieces per day.

THE PROBLEM: Again and again, tools would fail after running only a half-day.

THE SOLUTION: Needing greater toughness, they selected *Solar* and got these results:

1. Tool life increased from 8,000 to 200,000 pieces, and the tool room had 48 fewer tools to make each month.
2. Output was stepped up 11,160 pieces per month.

How the Carpenter Matched Set Method Works



These nine steels will solve practically any problem that can come up in your tool room. They are called "Matched Tool Steels" because each one picks up its job where the other "leaves off".

The key steel is the one in the center—*No. 11 Special*, a straight carbon, tough timbre, water-hardening tool steel. When you have a tool to make, you ask yourself if it can be made from *No. 11 Special*. If the answer is "Yes", you go no further. But when the answer is "No", you use the diagram to point the way to the tool steel properties you need for the job.

For *greater wear resistance* you go north. For *greater hardening accuracy and safety*, you go east, etc. Thus, the Matched Set Method simplifies your tool steel selection problems.

Send for your copy of the "Carpenter Matched Tool Steel Manual" shown on the opposite page. It will tell you the whole story about the Matched Set Method, and will give you simplified heat treating instructions that will help you get better results.

Carpenter MATCHED TOOL STEELS

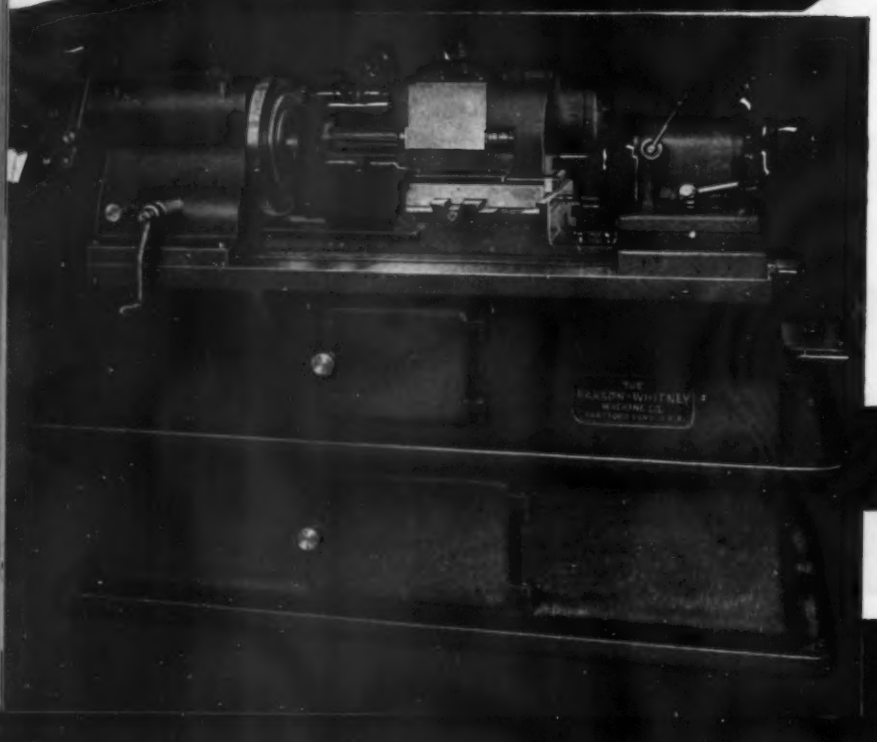
BRANCHES AT Chicago, Cleveland, Detroit, Hartford, St. Louis, Indianapolis, New York, Philadelphia

FASTER WORK

Time Saving... Faster Production

Pushed for time? A hectic schedule? Speed an essential ... plus quality to meet rigid inspection standards? H-W Semi-Automatic Thread Millers will help carry your load. H-W Thread Millers produce external or internal threads, right or left hand or taper, with equal facility and precision. The H-W milling method offers the advantages of multiple cutters . . . threading of all lengths within the machine's capacity in a single revolution of the work. Perfect threads are produced at high speed and with maximum setting convenience. Danger of spoiled work is greatly minimized . . . highest accuracy and precision are obtained. Permits working of many previously hard-to-thread materials . . . maintaining accuracy, precision and speed. With skilled mechanics at a premium H-W Thread Millers bring TWO vital advantages . . . accuracy and speed. Help yourself . . . and help the war effort.

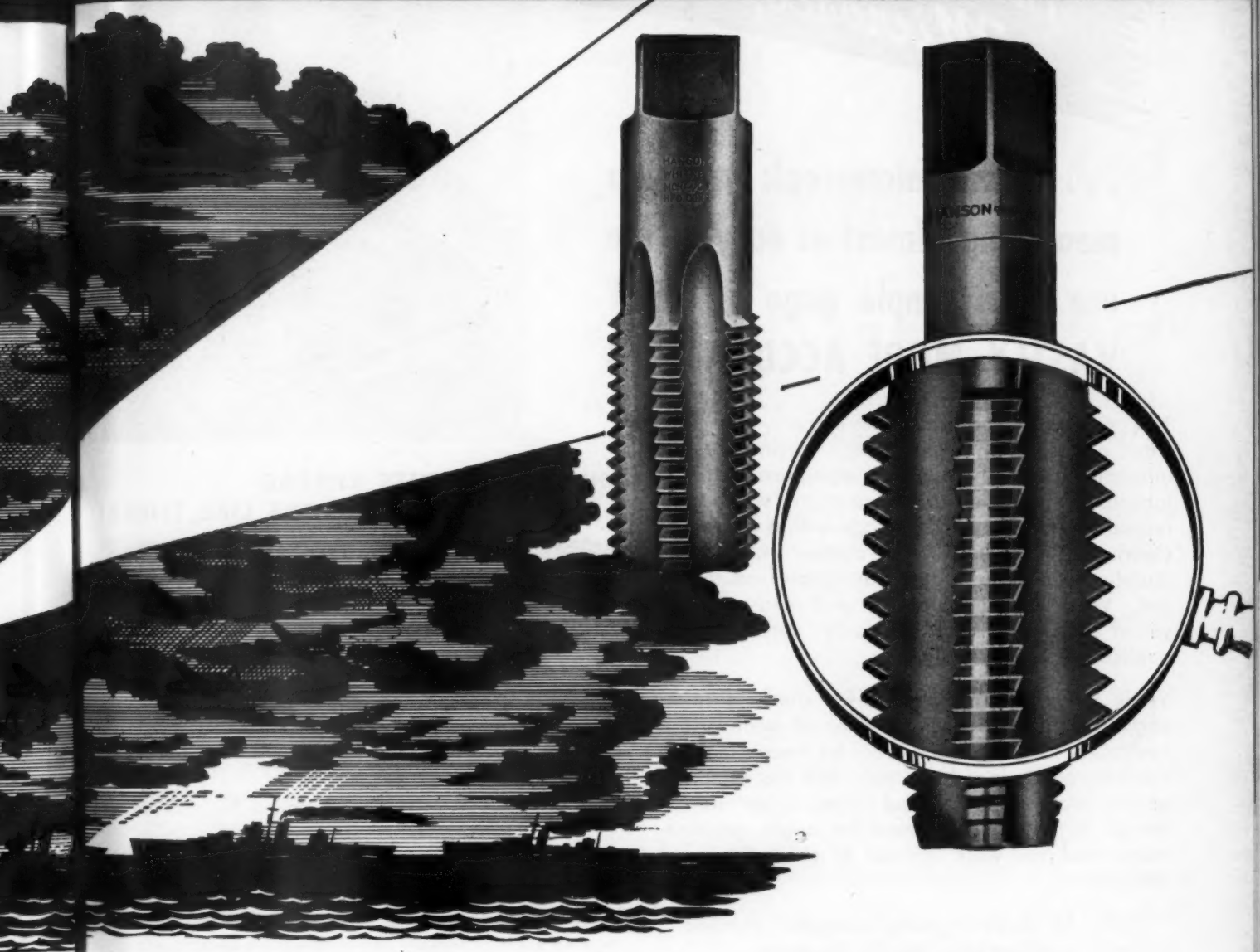
Descriptive literature on request.



Less down time . . . more accuracy . . . longer life. All these with H-W Taps. These advantages are made possible by the "Hanson Process" . . . our exclusive method of finishing after hardening . . . insuring uniform grain structure from tip to shank. H-W Taps are invariably correct in pitch and form

The **HANSON**

SPEEDIER VICTORY



. . longe
advantage
ocess" . .
ardening..
to shank
h and form

nd can be depended on for greater accuracy. very H-W tap is carefully inspected. Note the keen utting edges and the perfection of finish. Precise hread production . . . longer runs between grinds . . . peeded-up production . . . are insured by using -W taps. There's a H-W tap for every tapping problem. Look for the "Hanson Process" emblem in the taps you buy.

Today, as never before, time is important. Lives depend on it . . . and the nation's prestige. To conserve time is a duty. It means more work from fewer men. H-W taps will put more pep into your production. If you have a tapping problem write or wire . . .

WHITNEY MACHINE COMPANY

ARMY E NAVY

HARTFORD CONNECTICUT U.S.A

The Toolmakers Microscope

. . . makes microscopic precision measuring almost as easy as the use of a simple gage . . . BUT VASTLY MORE ACCURATE ! !

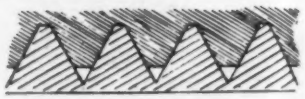
This precision measuring instrument — for tool room or inspection department — represents the ultimate in optical inspection equipment. It is a laboratory instrument as well as a production tool, reproducing the projected image with a degree of clearness and definition of contour that immediately discloses the slightest deviation from standard. Work is magnified 30X and measurements within 1/10,000" can be easily obtained and duplicated.

While virtually indispensable for checking form, angle, depth, lead and diameter of threads, the Toolmaker's Microscope is ideal for measuring and checking all kinds of form tools, drill jigs, templets, gages, machine parts and many other similar things. It may also be used for angle measurements and for work difficult to check by usual methods.

Write for bulletin giving complete detailed specifications. Ask for quotation.

QUICKLY DETECTS THREAD ERRORS LIKE THESE!

Lead error — resulting in bearing at only every fourth thread.

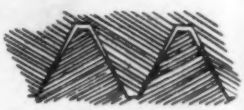


Threads too sharp at minor diameter — resulting in possibility of easily broken screws.

Screw with lead error — resulting in the necessity for its being smaller in order to enter standard size threaded hole.

Thread at wrong angle to axis resulting in very little contact.

Incorrect angles of threads — resulting in deceptive pitch diameter measurements.



Threads bearing at root only — another reason for very little contact.

GEORGE SCHERR CO.
INCORPORATED
124 LAFAYETTE STREET NEW YORK 13, N. Y.

On Thanksgiving Day, a Westinghouse Supervisor in New York was just sitting down to his turkey dinner when a long distance call came through.

He ran out on the Turkey

BUT THE TANKER SAILED!

A tanker in Mobile, Alabama, about to sail for the war front, needed immediate replacement of two Micarta stern tube bearings.

The New York supervisor phoned three workmen to meet him immediately at the Westinghouse District *Manufacturing and Repair** Plant.

Micarta sheets were taken from the storeroom, saws and milling machines set up—and the bearings made, packed and shipped by 10:30 that night.

Forty-eight hours from the time the order was entered, the bearings arrived in Mobile. And the tanker sailed on time, to help supply an important military operation.

Westinghouse M & R men have the "know-how" that comes only from years of experience. Each plant is backed by the complete engineering, research and manufacturing facilities of the Westinghouse Company.

J-90502

When vital electrical equipment needs repair . . . phone the nearest office of Westinghouse Electric and Manufacturing Company for

Westinghouse

COMPLETE REPAIR SERVICE

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OF COURSE YOU'LL BE USING MAGNESIUM

It's things like this your designers need to know

Magnesium alloys have good resistance to fatigue. Like other metals, however, they are sensitive to the effect of notches and other stress-raising factors. For example, the middle test bar shown above, with its sharp corners at the cast-on center ring, has only half the fatigue strength of its two neighbors.

What to do and mistakes to avoid are told in the new book, "Designing with Magnesium", just published by American Magnesium. Your designers should have this book for a guide in changing over to magnesium. Copies will be sent free to the men you name in your organization.

Now that magnesium has become more abundant, many products will be redesigned in magnesium. At the same time, weight will be saved, while retaining high safety and reasonable costs. Our engineers will gladly assist you in this design work. Write American Magnesium Corporation, 1709 Gulf Building, Pittsburgh, Pennsylvania.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM CORPORATION

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

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Tool-up NOW . . .

For Greater War Production . . . and Be Tooled-up for Post-War Competition

Equip every lathe, planer, slotter and shaper with a complete set of ARMSTRONG TOOL HOLDERS — with the correct types and sizes for every operation. While the extra strength and ready adaptability of ARMSTRONG TOOL HOLDERS make it possible to "get by" with a minimum of types and sizes, the correct ARMSTRONG TOOL HOLDERS will permit greatly increased production on each operation — will permit speed and feeds often double so-called "Standard" speeds and feeds, without loss of cutting efficiency.

Tool-up completely now with ARMSTRONG TOOL HOLDERS to increase your War Production and you will also be tooled-up for post-war competition, because each ARMSTRONG TOOL HOLDER is a permanent, multi-purpose tool that will not only outlast the war, but with the change of a cutter, will be ready to start on post-war production.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
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Buy ARMSTRONG from your supply house

ARMSTRONG TOOL HOLDERS Are Used in Over 96% of the Machine Shops and Tool Rooms

Taper boring ship propellors is but one
many war jobs being turned out by BETTS BORING Mil
After the war these mills will help the nation re-tool for civilian produc

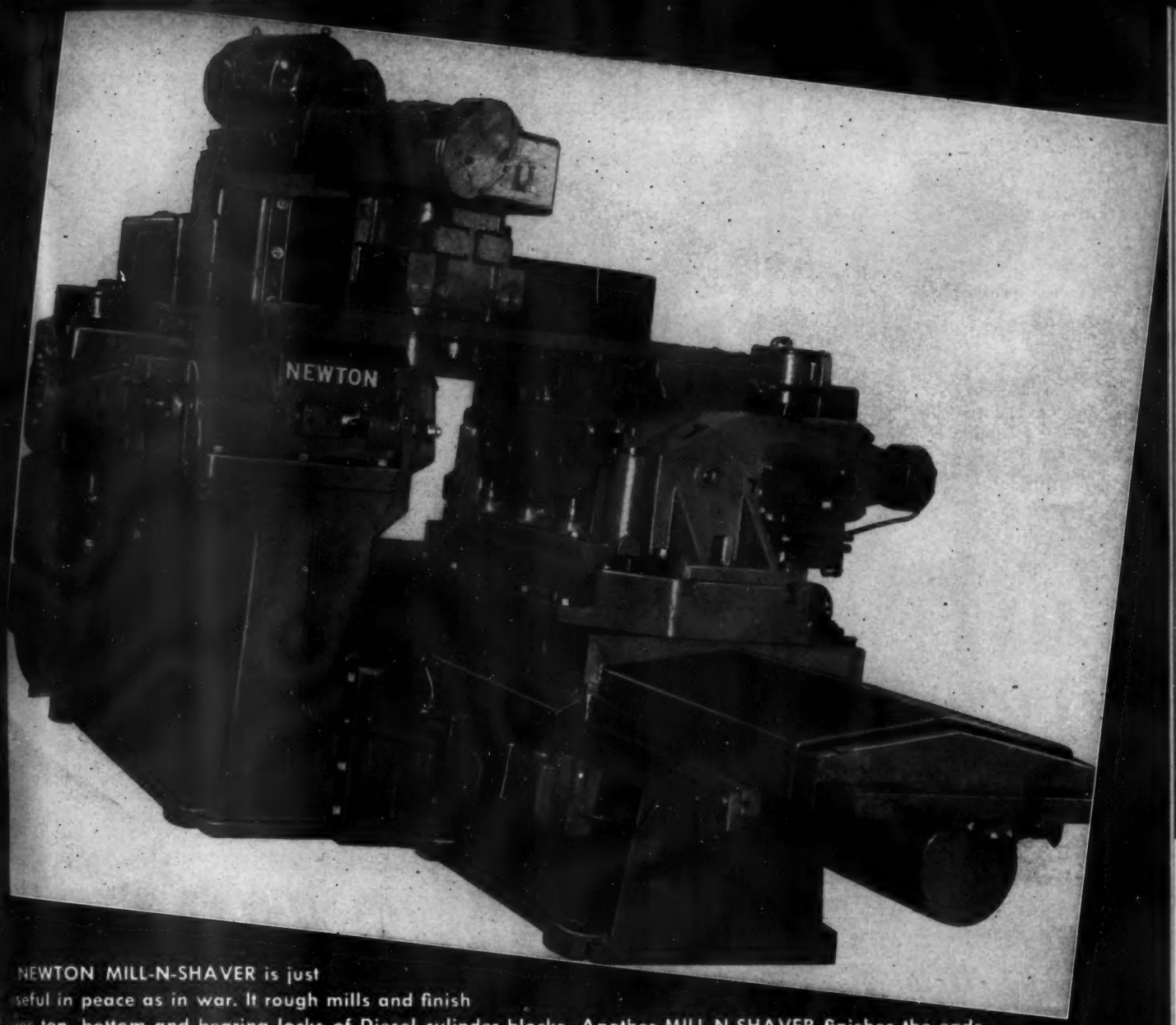
Consolidated Machines Help

Consolidated has always built big machines for big jobs. Right now we are supplying big machines for the biggest job of all—Victory over the Axis. Some day in the not too distant future this job is going to be finished. Then the big Betts 25′ Boring Mill shown above and the Newton Duplex Milling and Shaving

BETTS BETTS-BRIDGEFORD NEWTON

CONSOLIDATED MACHINE

ROCHESTER 10,



NEWTON MILL-N-SHAVER is just
seful in peace as in war. It rough mills and finish
es top, bottom and bearing locks of Diesel cylinder blocks. Another MILL-N-SHAVER finishes the ends.

Pave the Way to VICTORY

Machine opposite will turn from production for war to production for peace. We'd like you to remember that Consolidated makes practically any type of big machine tool you will need for peace-time production. As you make your plans for the future, we invite you to contact us for any advice or information you may require.

OLBURN HILLES & JONES MODERN

OOL CORPORATION
EW YORK

RELY ON SIBLEY SKILL

for Special Machinery as well as Drill Presses

You can depend upon Sibley for the necessary "know how" to produce the type of special machinery you need to meet your requirements.

Long experience in both drilling and special machinery manufacture for America's leading companies enables the Sibley staff to meet exacting specifications of any tough job you may have.

Available facilities permit Sibley to offer this specialized service now to a limited number of new customers. Here may be the answer to your present war production problems and peace-time plans.

SKILL COUNTS IN SPECIAL MACHINING WORK

Sibley's ability to manufacture to close tolerances has been the answer to many production problems confronting leading manufacturers. If you need help on regular or special machine work, write, wire or phone.

SIBLEY MACHINE & FOUNDRY CORP.

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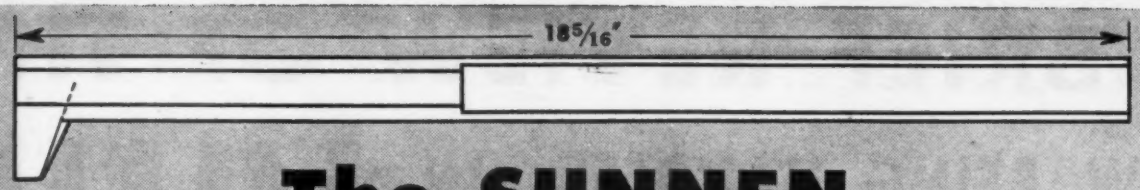


The SUNNEN PRECISION HONING MACHINE

The coveted Army-Navy "E" waves over the Sunnen plant —evidence of the important part Sunnen Equipment is playing in the war effort.

"Did such a fine job of honing it will pay for itself many times over in the saving of scrap parts and time" . . .

Mr. A. G. Massey, Massey Machine Company

The drawing shown above is of a steel part from a 20 MM aircraft gun. By former methods of honing, too many of these parts were being rejected because they were being cut oversize with no means of salvaging them.

A consultation with a Sunnen Service Engineer led to the installation of the Sunnen Precision Honing Machine to handle these finishing operations. In the manufacturer's own words — "This machine is going to pay for itself many times over in a short while in saving of scrap parts and time." In addition, he is getting a better surface finish.

Consider These Advantages

Wide range — handles internal diameters of .185" to 2.625". Accuracy within "one-tenth" guaranteed — has been held to .000025" on production jobs. Relieves big internal grinders for other jobs. Corrects errors of out-of-roundness or taper caused by previous operations. Facilitates duplication of sizes. Does not require skilled labor. Practical — inexpensive — economical to operate.

Put Sunnen Honing to work in your plant!

SUNNEN PRODUCTS CO., 7941 Manchester Ave, St. Louis, Mo.

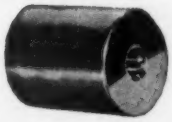
Canadian Factory: Chatham, Ontario

Typical Jobs SUNNEN

Aircraft Instrument Panel Control Wire Bushing. Hole .187" diameter — held to .0002", stock removal .001", sixty per hour.

Aircraft Hydraulic Brake Cylinder. Honing 3 times faster than lapping—and gave a straighter hole.

Roller Bearing Outer Race. Finish improved from 12 micro-inches to 2 micro-inches.

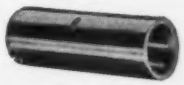


Header Die. Life of header dies increased 3 to 9 times over lapping. Knock out pin breakage practically eliminated.

Aircraft Valve Tappet Roller. Honed after grinding to give 100% bearing surface.

Stainless Steel Load Compensator Valve Seat. Hole is honed to .0002" limit.

Aircraft Carbureter Operating Valve Sleeve. Sunnen honing eliminates distortion from assembling operation.



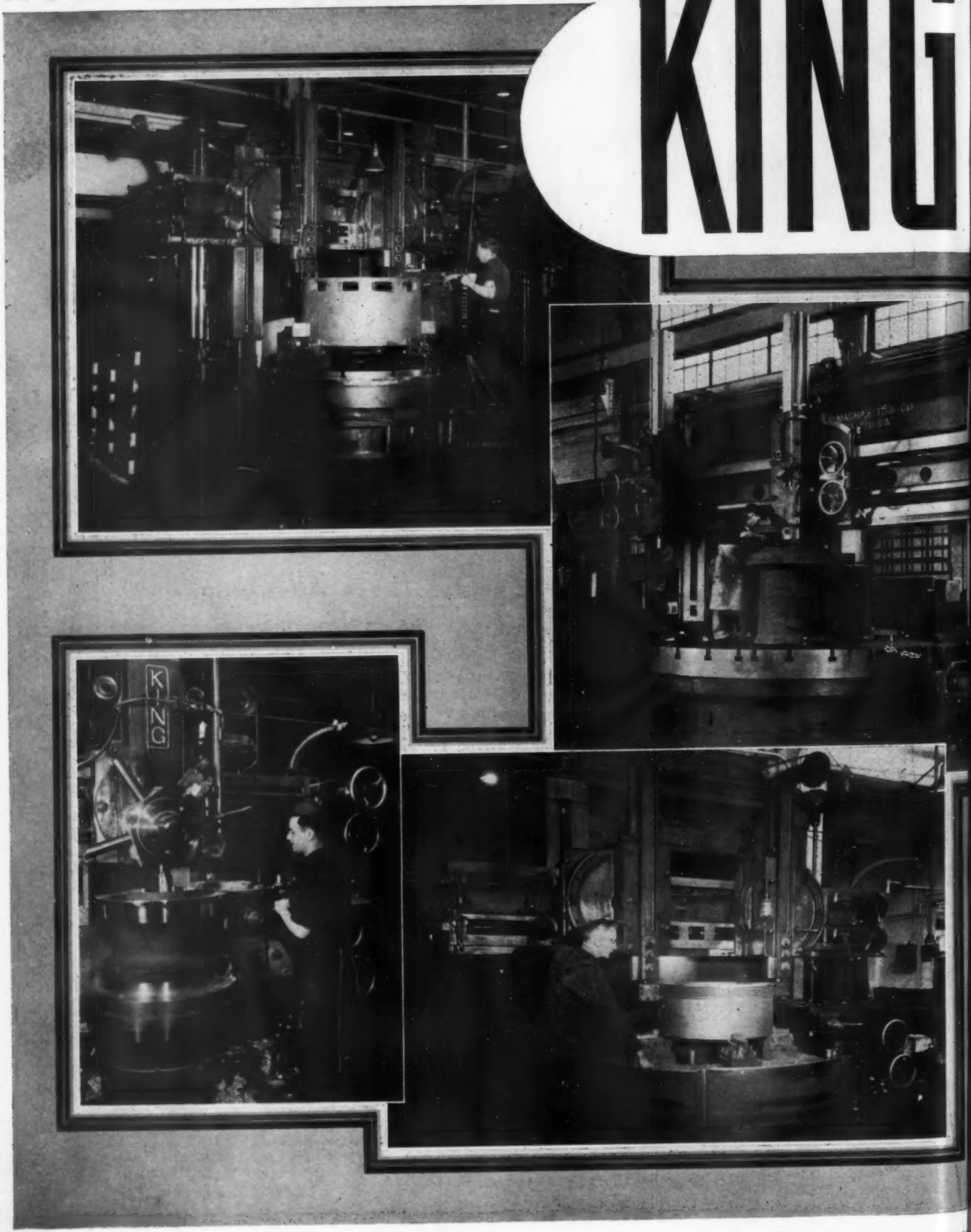
Aircraft Piston Pin. Sunnen honing is twice as fast and gives a cleaner, better looking pin.

Bearing. A very small part. 2 micro-inch finish necessary.

Automobile Distributor Shaft Gears. Taper removed at a rate of 80-90 per hour.

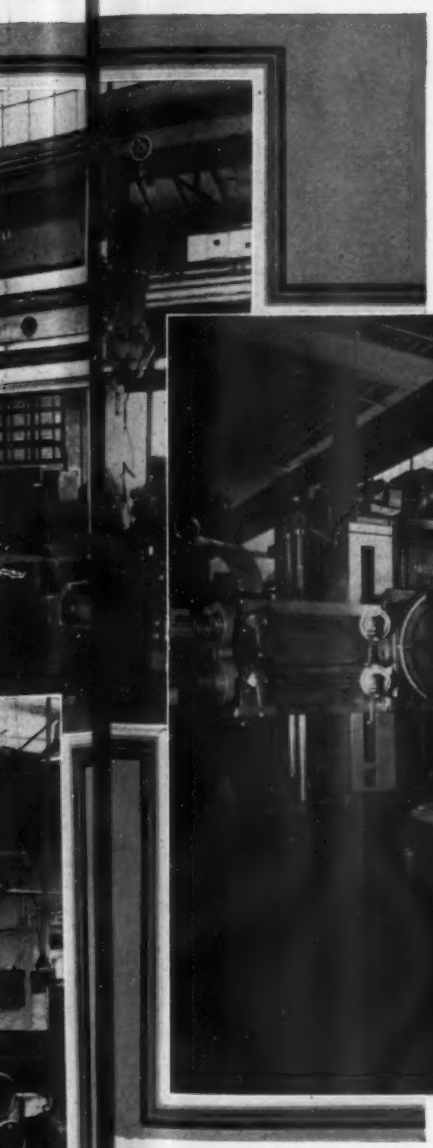
A BRIEF REVIEW OF THE

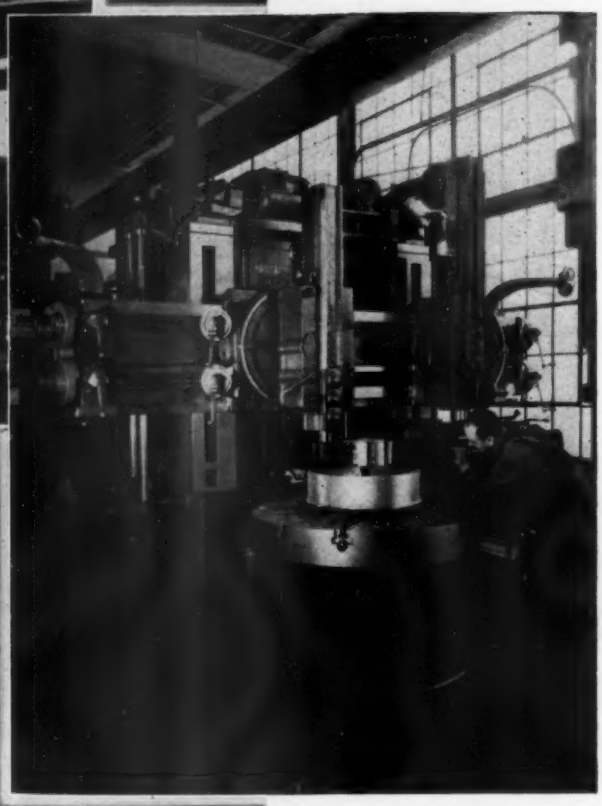
NOW BEING HANDLED ON KING



E INNUMERABLE JOBS

G Vertical BORING AND TURNING MACHINES





● The accompanying illustrations are evidence of the wide range of work that is flowing daily from King Boring & Turning Machines.

Here also are shown a range of machines from the 30 inch single column types up to the 12 foot swing.

All the various operations such as boring — turning — and facing are being performed on these machines. The jobs include a representative lot of work — for example turning brake drums on 20 inch airplane wheels — boring and turning alloy nickel steel drums, — turning slots in flywheel castings for a punch press are a few of those illustrated.

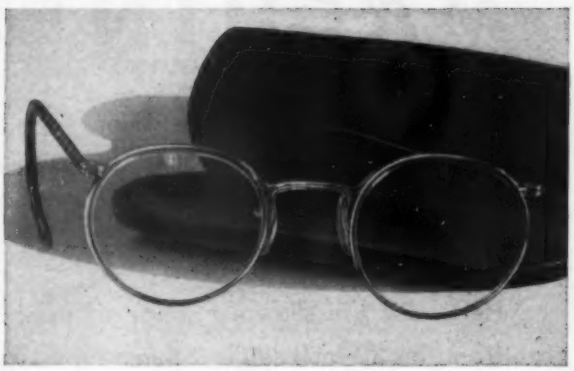
Thus it can be seen, that regardless of material, if the job can be done on a vertical boring machine — you can put it on a King — for dependable accuracy — high productivity — and low costs.

The KING MACHINE TOOL Company

Builders of Vertical Boring and Turning Machines Exclusively

CINCINNATI 32, OHIO, U.S.A.

He had no peer as a Tool Maker... *until he lost an eye*



...all workers on or near Eye Hazardous Jobs need AO GOGGLES

Are the highly skilled men in your plant wearing goggles? The price of the finest pair of AO Goggles is trifling compared with the loss — even for half a day—of the services of one of your skilled men.

An adequate eye protection program that provides AO goggles for every man and woman who works on or near an eye hazardous job will pay for itself in a few months. AO Goggles are designed to give maximum protection and workers find them comfortable to wear. Ask your Safety Director to get in touch with the American Optical Company's branch office nearest you.

American Optical

COMPANY

SOUTHBRIDGE, MASSACHUSETTS

Manufacturers for more than 110 Years of products to Aid and Protect Vision. Branches in all principal industrial centers

No matter how well, accurate, close measuring tools may be made, they **all** must have careful use to protect them from injury and premature wear. You **must** "Treat 'Em Right" to get the full service **they** can give **you**.

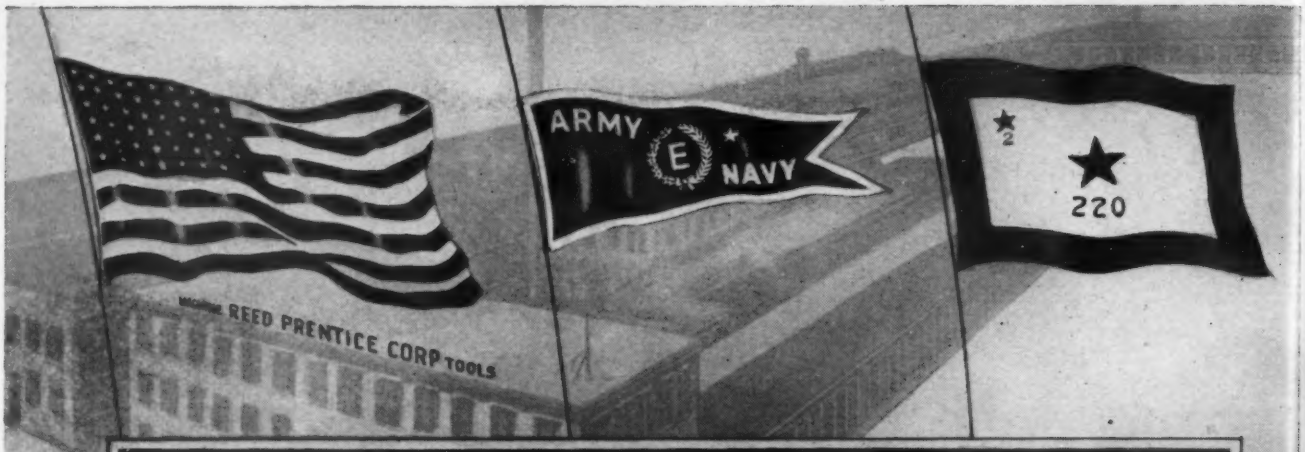
Today with tools truly weapons, following these simple rules will help:

1. **Set tools down carefully.**
2. **Protect tools from grit or abrasive.**
3. **Wipe tools with an oily rag to prevent rusting.**
4. **Keep tools in a wooden box or case.**
5. **Don't force measuring points.**
6. **Don't measure moving work.**

Simple precautions — but they'll make **more tools** available for **more production** during this emergency.

We are proud to be honored with the Navy "E", awarded for outstanding accomplishment in Defense production.
Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.

BROWN & SHARPE TOOLS



STATEMENT of POLICY

Policy of the Reed-Prentice Corporation for the Present and the Postwar Period:

Present--

To manufacture finest quality machine tools for war production.

To utilize all our available surplus facilities for subcontract work for the United States Services.

To aid in winning the war at the earliest possible moment.

Postwar—

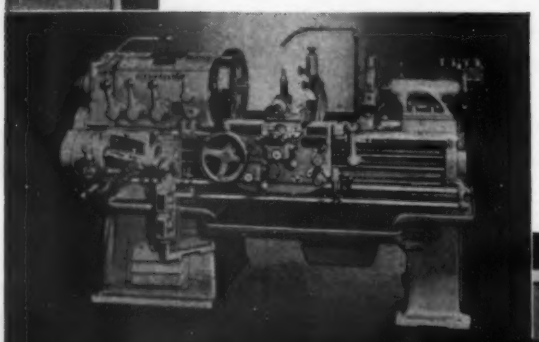
To provide employment for our former employees now with the armed forces.

To put into production the many machines which are now in the experimental stage.

To build our products, incorporating the latest proven devices, in such a manner that new markets will be opened because of obsolescence of present day equipment.

To stick to the type of machines which seventy-five years of experience have taught us to build, and build well.

To incorporate into those machines, the very best of materials and workmanship.



Reed-Prentice Corporation

Manufacturers of engine and toolroom lathes, vertical milling machines, die casting machines, plastic injection molding machines and portable "Timberhog" chain saws for timber cutting.

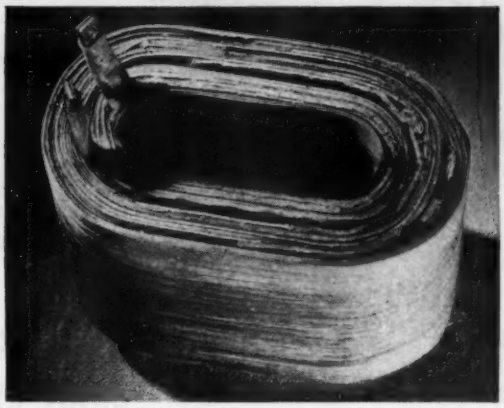
BRANCH OFFICES
1213 W. 3rd. St.
Cleveland. Ohio
75 West St.
New York City. N. Y.

REED-PRENTICE CORP.

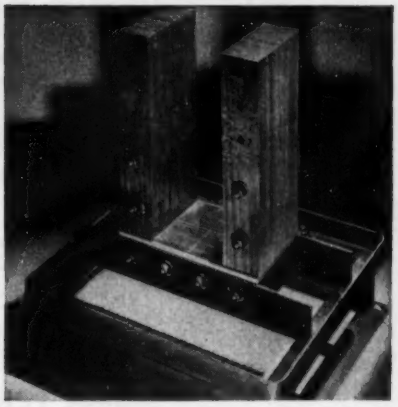
MAIN OFFICE
WORCESTER
MASS. U. S. A.

GET FINER AND FASTER A. C WELDING WITH AMPAC "400"

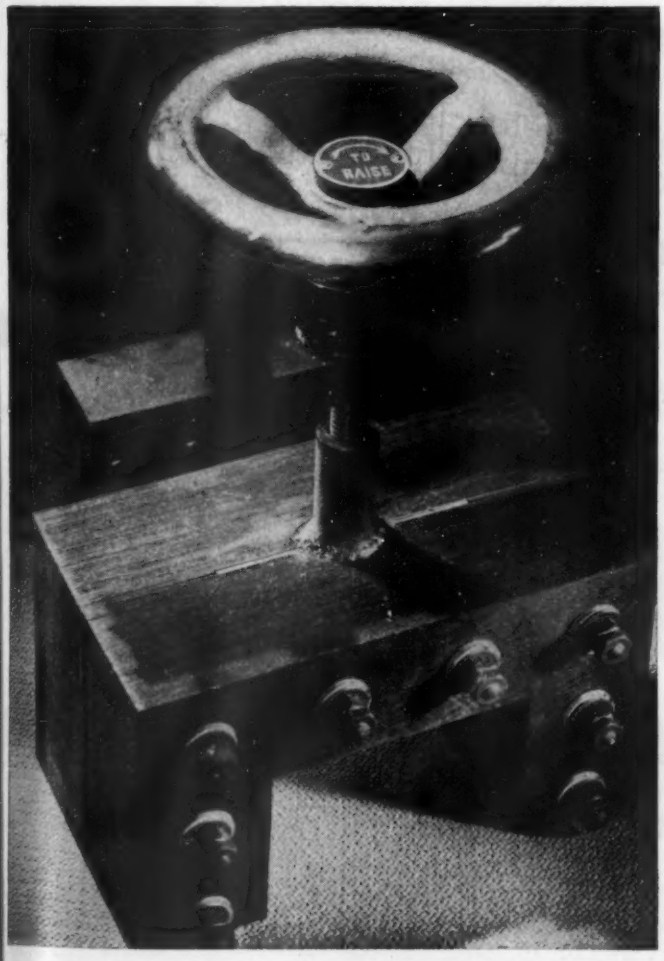
1 Revolutionary new patented circuit *increases* efficiency — *cuts* idling loss! Entire construction is *simple, rugged!*



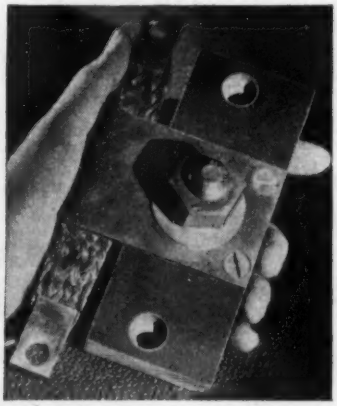
2 Transformer coil uses *rectangular* copper — glass-insulated — with primary over secondary. Air duct between windings dissipates heat — *prevents* breakdown!



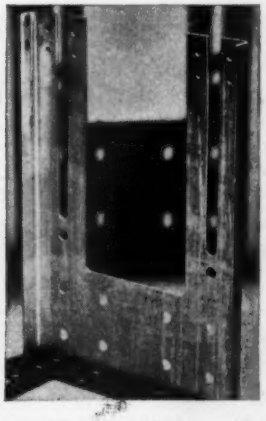
3 Sturdy lower core is 1-piece, U-shaped . . . of die-punched silicon steel. Insures quiet operation . . . with *no* power-wasting air gaps!



6 Power regulation is *smooth — quick — simple!* One-inch movement of upper core covers entire welding range — 50 to 500 amps — in *seven turns* of control wheel. Cuts adjustment time to *minimum*. Speeds welding! A 1677



4 Here's typical Ampac quality — a big, tough, *extra heavy* welding terminal. Note *brazed* connections!



5 Hardened brass guide is simple, fool-proof! Channel shape provides *extra* strength.

GET COMPLETE FACTS on this brilliantly engineered a.c. welder from your nearby Ampac dealer or Allis-Chalmers district office. Ask for bulletin B6302. For data on new Ampac "200" welder, ask for bulletin B6241.

ALLIS-CHALMERS

MILWAUKEE, WISCONSIN

READY FOR ACTION...QUICK CLEAN-UPS

SUN SPIRITS
speeds cleaning of precision plane parts

To help speed his production, one manufacturer of aircraft parts has been using Sun Spirits for cleaning throughout the plant. This modern, pure petroleum solvent meets the needs for the majority of cleaning operations because it is:

Fast... always ready for use—requires no mixing or heating.

Thoroughly efficient—leaves parts sparkling clean—ready for the next process.

Economical—because it's long lasting . . . easily reclaimed.

Safe—approved by National Board of Fire Underwriters for industrial use.

For helpful, factual information on metal cleaning, write for your free copy of "Case Histories of Cleaning Up War Parts."

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Sun Oil Company, Limited, Toronto, Canada

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METAL DRILLING MACHINERY

SUPER SERVICE
C B
3' or 4' ARM with 9" COL.
RADIAL
BULLETIN R-21-B
JIG BORER
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Productivity, Capacity, Adaptability, Reliability, Accuracy, Convenience and Economy are the intangible components that give the Cincinnati Bickford line of drills the appropriate name of SUPER SERVICE. Examine the possibilities of the machines shown here and for further information send for any or all of the bulletins pertaining to the machines that interest you.
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OAKLEY, CINCINNATI, OHIO
ARMY E NAVY
4' ARM 13" COL. to 8' ARM 19" COL.
RADIAL
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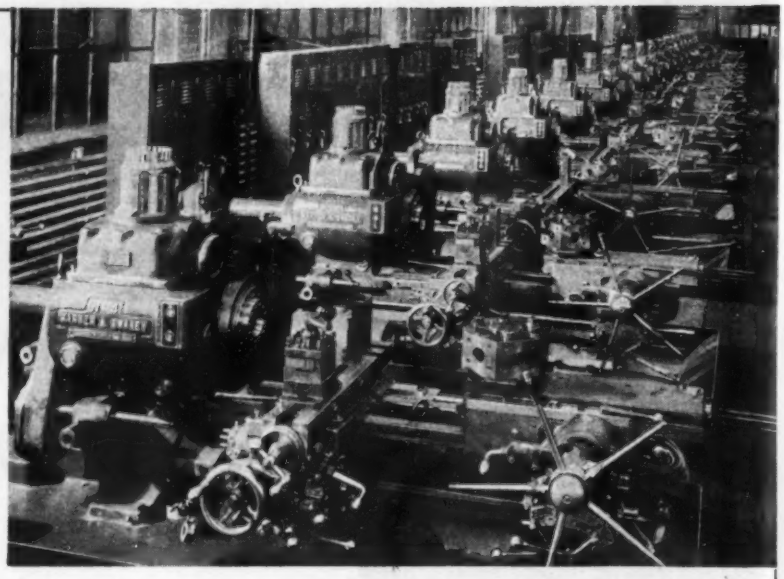
21", 24", a 28" ROUND and BOX COL. UPRIGHTS
BULLETIN U-25
THE CINCINNATI BICKFORD TOOL CO.
METAL DRILLING MACHINERY



400,000 Friends

who will be waiting to give soldiers jobs

While American industry is intent on winning the war, it has an obligation to plan ahead—as the government is doing —so that victory will not be a mockery to those who won it.

The 400,000 machine tools built for war can be the best friends our soldiers have when they return someday. If these machines are distributed quickly *and wisely* from war plants to peace plants, they can start turning out the goods to meet dammed up demand. And in meeting it, they'll provide jobs without which that demand will dry up and so start a depression.

These machine tools are badly needed in thousands of American plants whose tools are old, inefficient, wasteful. These newer tools would help such plants turn out goods at lower costs—which broadens markets, makes workers' jobs more secure, provides more good things of life for more people.

Jobs and better living for all who will work efficiently.. isn't that what everyone wants after the war? Then plan your machine tool needs now, so that you will be ready to provide your share of both those prizes of peace.

YOU CAN TURN IT BETTER, FASTER, FOR LESS...WITH A WARNER & SWASEY

WARNER & SWASEY Turret Lathes Cleveland, Ohio U.S.A.

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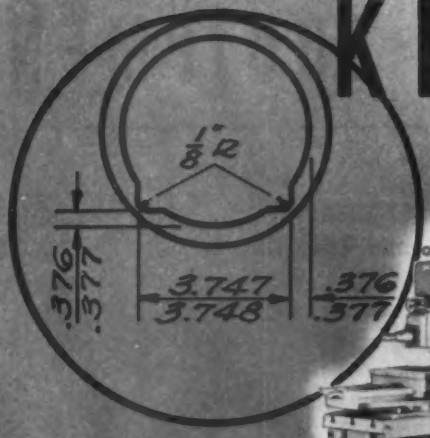
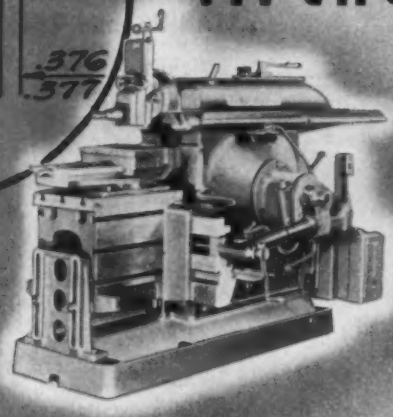
KEY WAYS ...the right way!





. . . . Internal shaping is another function of the Shaper requiring accurate performance. Here a Cincinnati Shaper holds close tolerances cutting Kennedy Key Ways in an eccentric.

Write for Catalog N-2

THE CINCINNATI SHAPER CO.

CINCINNATI OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

American Machinist

ESTABLISHED 1877 • BURNHAM FINNEY, EDITOR

War-Born Shop Methods Will Influence Postwar Production

MANUFACTURING PROCESSES in the metal-working industry, developed under the stinging lash of national peril, will leave a permanent imprint on the shop of tomorrow. Of course, not all the war-born tools designed to create weapons of destruction at record-breaking speed can be adapted in their entirety to peacetime production. Many of them are too specialized for this transition. But many other advances in manufacture evolved under the stress of emergency are here to stay.

For one thing machining rates have been lifted to new high levels. Credit for this progress goes to ingenuity in tool design and to the wider use of sintered carbides. Experiments on cutting-edge grinding, with greater use of negative rake and helix angles on milling cutters, has made it possible to boost machine speeds to an amazing degree.

Reduction in machining time has been accomplished on virtually all metals used in wartime manufacture. Speeds of 600 ft. per min. and better are being used on tough alloy steels formerly cut at a quarter of this rate. But perhaps the most sensational advances have been made on the light metals—aluminum and magnesium.

New Yardsticks Needed

Wartime experience has disclosed the fact that production yardsticks based on cast iron and steel do not even cover the range of machining speeds for the light alloys. When these materials were employed in limited quantities their very ease of working hid their production potentialities. Shop men were content to put the machine speed to its top notch and let it go at that. Until the war brought home the fact, they were unaware that these light metals called for a new range of speeds—up into the 10,000 ft. per min. level. There is still much to be done in this direction.

Scarcely less important has been the initiation of new ideas into the field of sheet-metal working. The aircraft industry, in particular, was called upon to make tools for forming, trimming and perforating steel and duralumin sheets without taking months of toolmaking time to do so. Tool engineers in this field turned to the so-called "quick and dirty" methods of dic design—methods that were speedy and yet adaptable to the rapidly changing demands of the Army and Navy for new warplanes.

The stretch press, which draws a metal sheet over a wooden or plaster form, was dug out of the limbo of the past and refined by modern engineering to form a highly serviceable tool. The drop hammer, too, was revived and supplemented by a more efficient air-operated counterpart. The hydraulic press was put to work but the tools used on it were not those formerly used. They employed plastics and low-melting-point alloys which could be quickly cast to shape eliminating the tedious toolmaking hours needed for dies of iron or steel. As a result thousands of tooling hours have been saved to speed the delivery of fighting planes to the battle front. Thus was the balance of air power tipped in favor of this nation and its allies.

Electronics had entered the shop before the war but in a hesitant and tentative fashion. Now this new field of science has won its service stripes. One of the earliest applications was to use the electric eye principle for invisible machine guards particularly on punch presses where the hazard to the workers' hands is high. The electronic tube is used also to count small parts and to determine color particularly when the workpiece is heated for hardening.

An extensive and fast growing employment of the principle lies in induction heating for heat-treatment, annealing, soldering or brazing. The process cycle is rapid and can be controlled so accurately that selected surfaces can be treated leaving the rest of the part in its original state. The method has the advantage of surface hardening, the core of the workpiece remaining soft and ductile.

Electronics is also used for electric-current conversion, one important use of which is the variable speed control of d.c. electric motors from an a.c. current source.

Electronics Aids Inspection

Resistance welding timers are now operated by electronic tubes. Inspection is facilitated by the use of electronics in several ways. For instance, rotating parts such as airplane crankshafts, propellers and gears can be balanced by this means to a fine degree of precision. X-ray inspection, once a laboratory procedure, is now available for routine shop inspection through the design of equipment which greatly reduces the time and cost of the process. Another device uses a tuned pick-up coil to determine metallurgical properties such as toughness, hardness penetration and analysis of small metal parts, both ferrous and nonferrous.

The pressure of war production has also stressed the value of straight-line production methods and the need of handling materials expeditiously with a minimum expenditure of human energy. Obviously the large scale entry of women into industrial occupations has stimulated the adoption of every possible means of easing work- and tool-handling operations.

Hand in hand with the need for speedy tooling and conservation of manpower has gone the insistence on quality and precision. These war-born methods, therefore, are in no sense makeshift—they are designed to turn out products to meet rigid military specifications. So all the elements for the successful manufacture of any product are present in these recent developments. Postwar industry should profit by them.

It takes
GOOD EQUIPMENT
to check
GOOD HOBS

You can get *both* from Michigan Tool Company

One of the reasons "Michigan" hobs are so consistently accurate is that Michigan Tool Company uses its own line of specially developed hob checking equipment for higher precision and faster checking of all the elements of a hob. This equipment is now available to hob users to insure that original hob quality will be maintained in service.

The Model #471 hob sharpening checker (illustrated above) for instance, will check:

1. Flute spacing, both parallel and spiral gash
2. Gash for correctness of radial, hook or rake sharpening
3. Parallelism of straight gashed hobs
4. Whether taper exists at O.D. of hob (across cutting edge)
5. Concentricity of proof diameters as well as O.D.
6. Pressure angle of hob as well as included angle on gear cutters
7. Lead of hob in axial section (not following helical path)
8. Depth of tooth (for topping hobs)

We will be glad to furnish hob users with further data on our various hob checkers. Ask also for a copy of the booklet on "Hobbing"—Bulletin #149-A.

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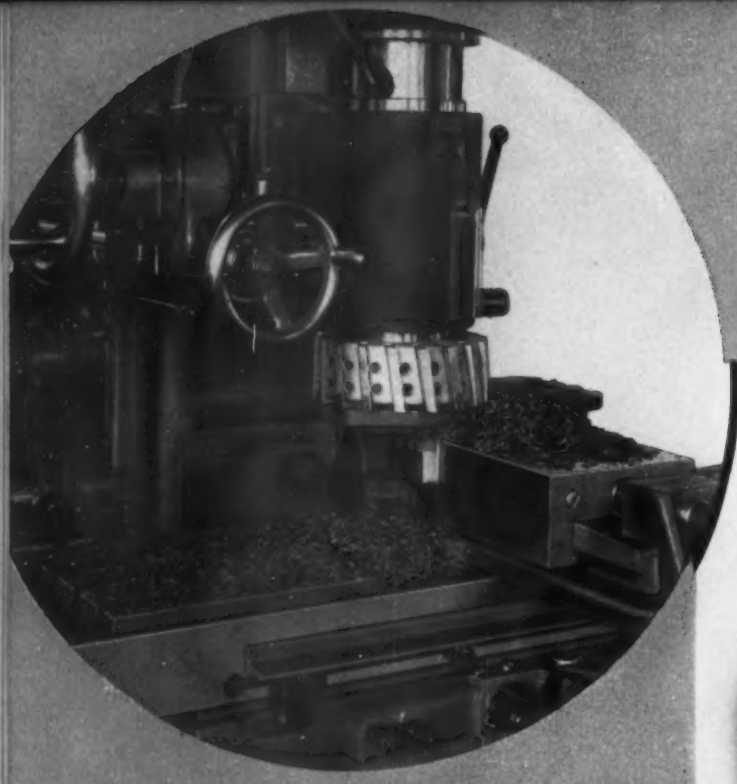
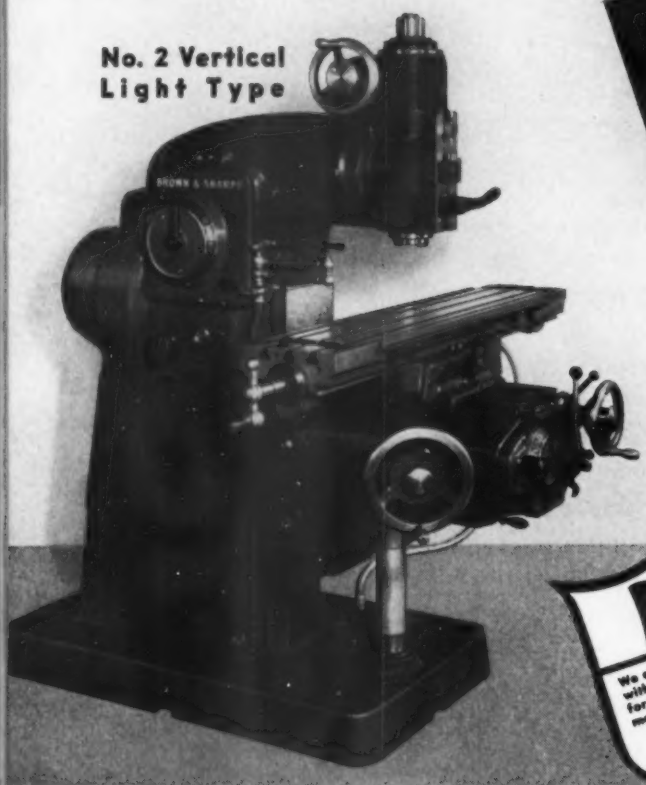


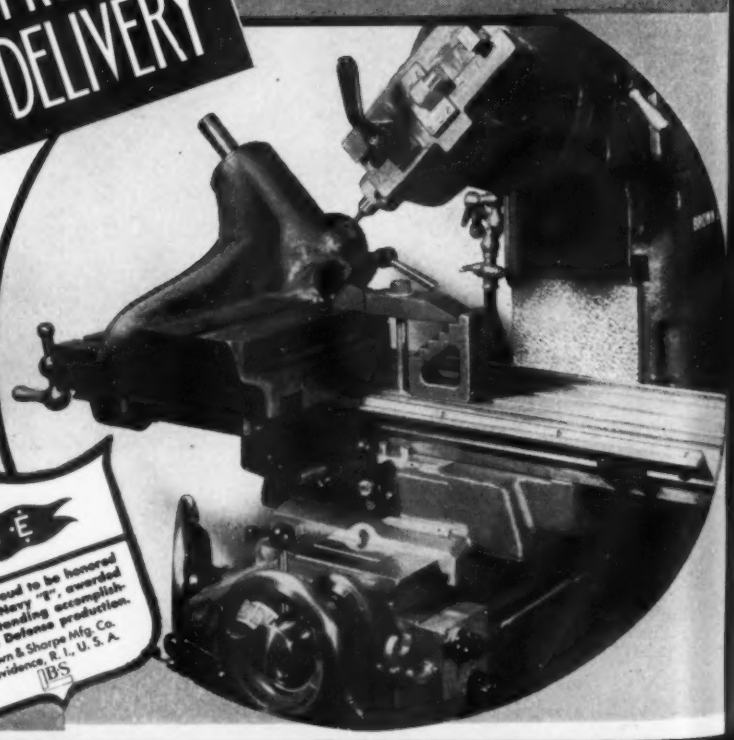
Designed for Broad Utility, Rapid Set-up, Efficient Operation and Maximum Rigidity Under Capacity Loads.

No. 2 Vertical Standard Type

No. 2 Vertical Light Type



PROMPT DELIVERY



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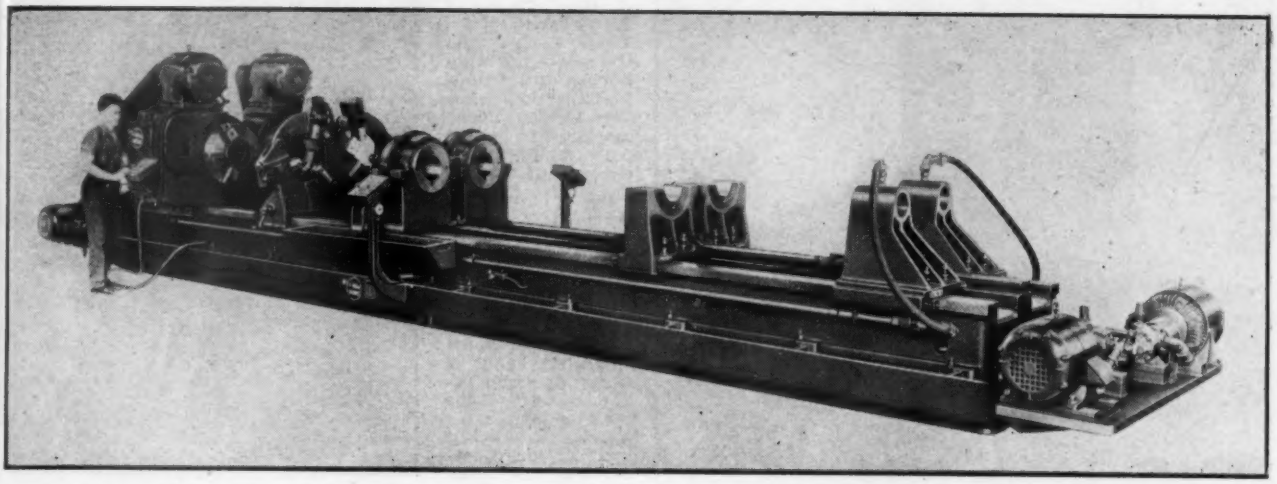
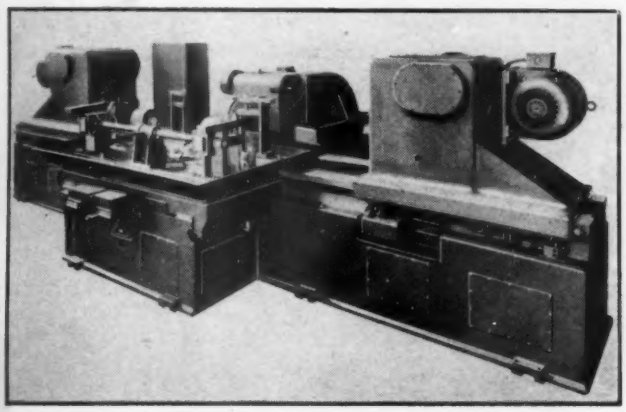
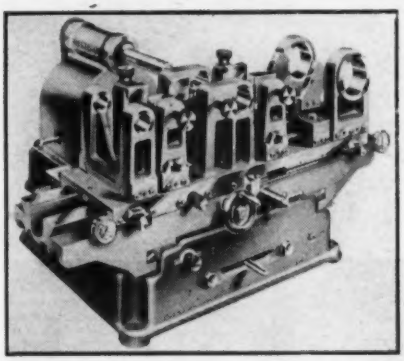
MACHINE TOOLS



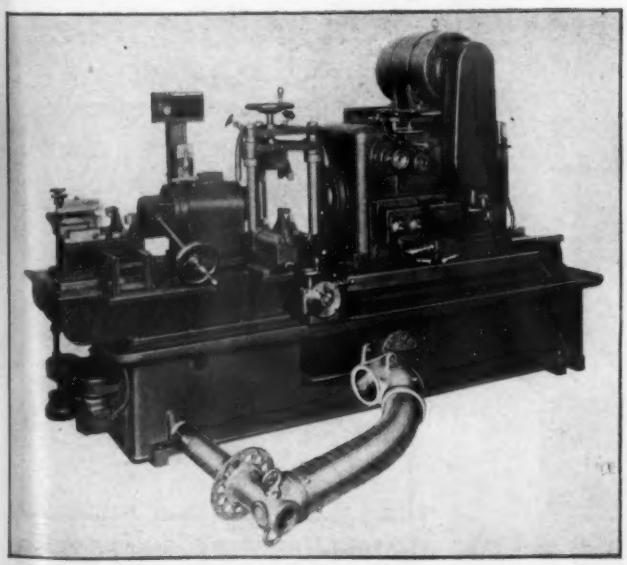
BORING MACHINE—*W. F. & John Barnes Co., Rockford, Ill.* Used extensively by the aircraft industry for boring large aircraft landing gear struts and recoil cylinders to maximum diameters of 14 in., this machine handles parts with maximum length of 67 in. Aug. 19, 1943, p. 131.



BORING MACHINE—*LeMaire Tool & Mfg. Co., 2657 S. Telegraph Rd., Dearborn, Mich.* A total of 12 holes in a 1300-lb. steel differential and final drive housing can be bored and counterbored with this special three-way machine. It has one center and two end heads. Oct. 14, 1943, p. 148.

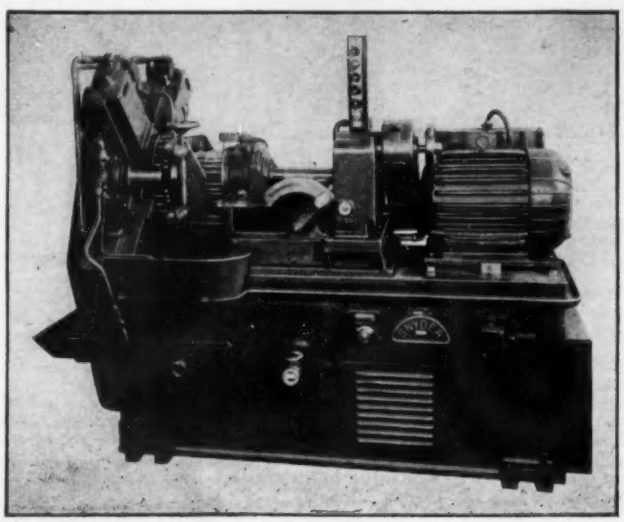


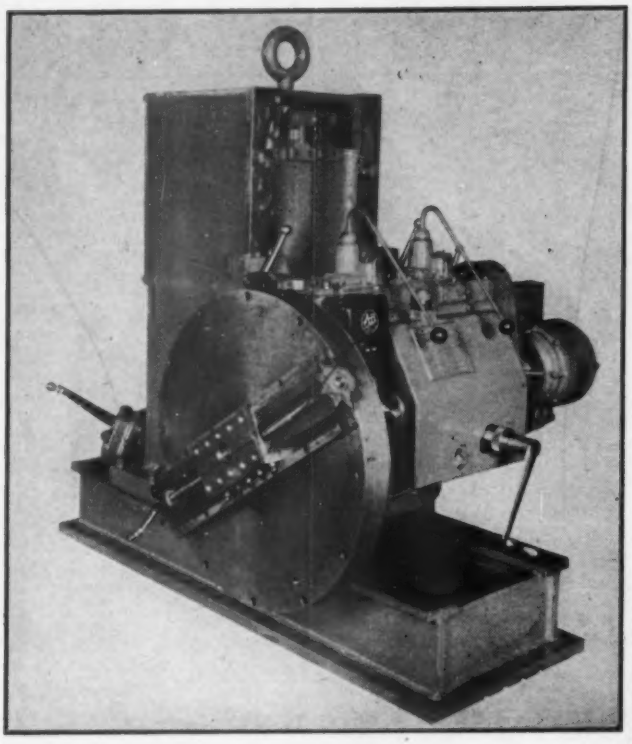
BORING MACHINE—*Century Engineering Co., 816 W. Fifth St., Los Angeles, Calif.* This light-weight machine, for use in aircraft and other plants and repair stations, handles connecting rods of various sizes. Aug. 5, 1943, p. 128.



BORING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* This single-spindle hydraulic boring and facing machine handles special aircraft parts. Apr. 1, 1943, p. 114.

SPOT-FACING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* All bolt holes in certain aircraft-engine cylinder barrels can be handled in one cycle, at the rate of 26 per hr. with this machine. June 10, 1943, p. 128.





FACING MACHINE — *General Engineering & Mfg. Co., 1523 S. Tenth St., St. Louis 4, Mo.* The Gemco portable boring and facing machine will handle work pieces too large to be put on standard equipment. Sept. 2, 1943, p. 130.

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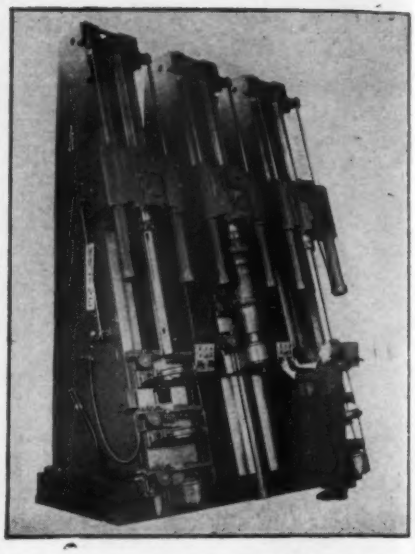

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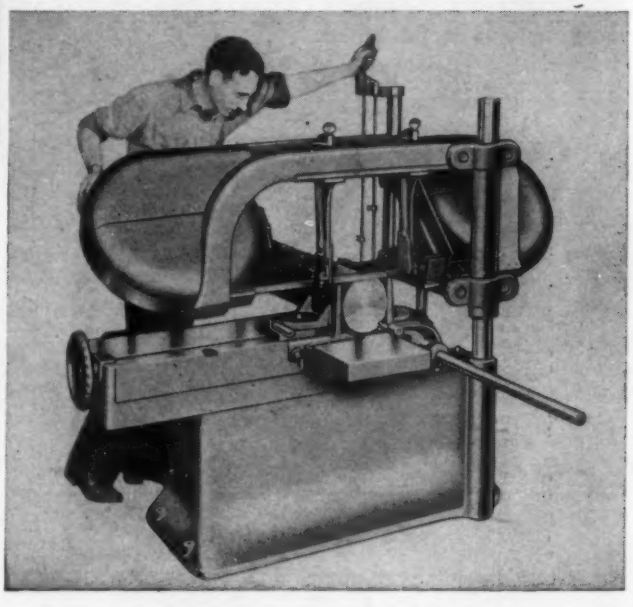
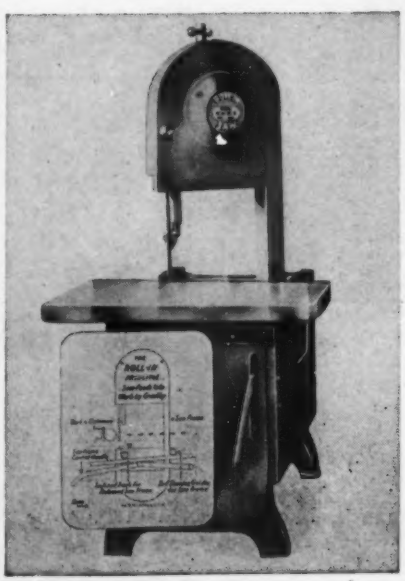
BORING MACHINE — *Moline Tool Co., Moline, Ill.* These machines consist of three units built together, each of which operates independently, for boring cylinder sleeves and facing ends of large diesel engines. May 13, 1943, p. 142.

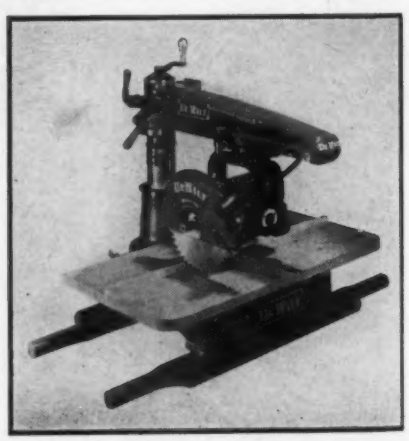


BANDSAW — *Wells Mfg. Corp., Three Rivers, Mich.* The Model V-12 machine is designed for continuous metal cutting of most metals to practically any shape; capacity 13x16 rectangular and 13 in. diameter rounds. Jan. 7, 1943, p. 118.

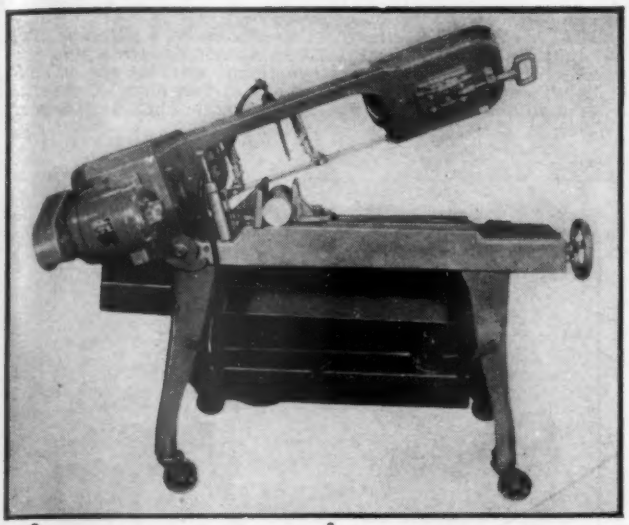
BANDSAW—*Boice-Crane Co., 935 Central Ave., Toledo, Ohio.* This machine cuts metals, plastics, wood and paper stock 8¾ in. thick and can accommodate work up to 27 in. diameter. June 10, 1943, p. 138.



BANDSAW—*Universal Vise & Tool Co., Parma, Mich.* The Roll-In metal cutting bandsaw operates on the gravity-feed principle. Any shape, heavy or light, long, short or round, can be handled, up to a maximum thickness of 7 in. June 10, 1943, p. 134.

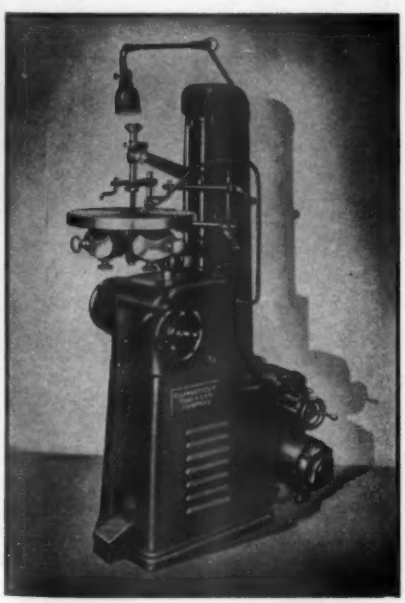


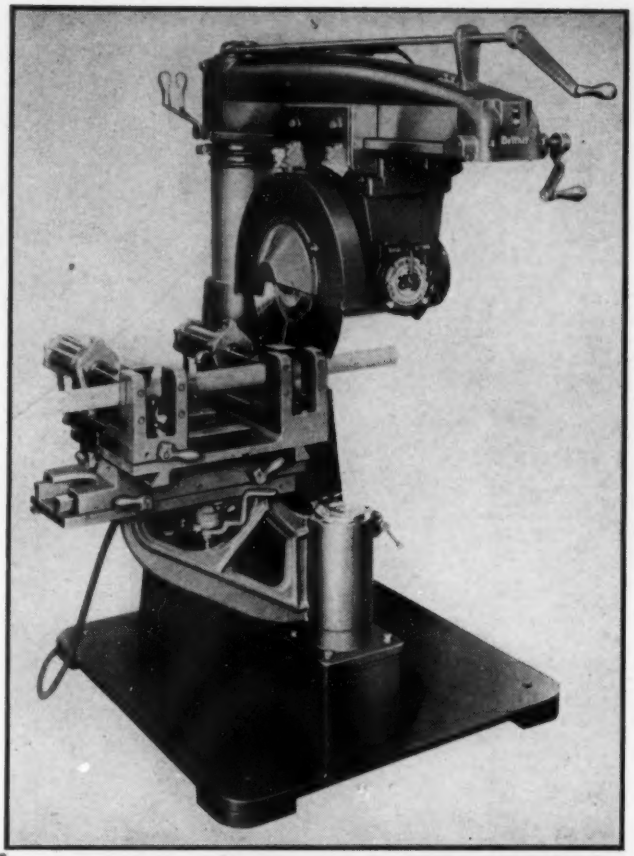
RADIAL SAW—*De Walt Products Corp., Lancaster, Pa.* This portable model saw cuts light metals when equipped with a metal saw or abrasive wheel. Available in three sizes. Nov. 11, 1943, p. 128.



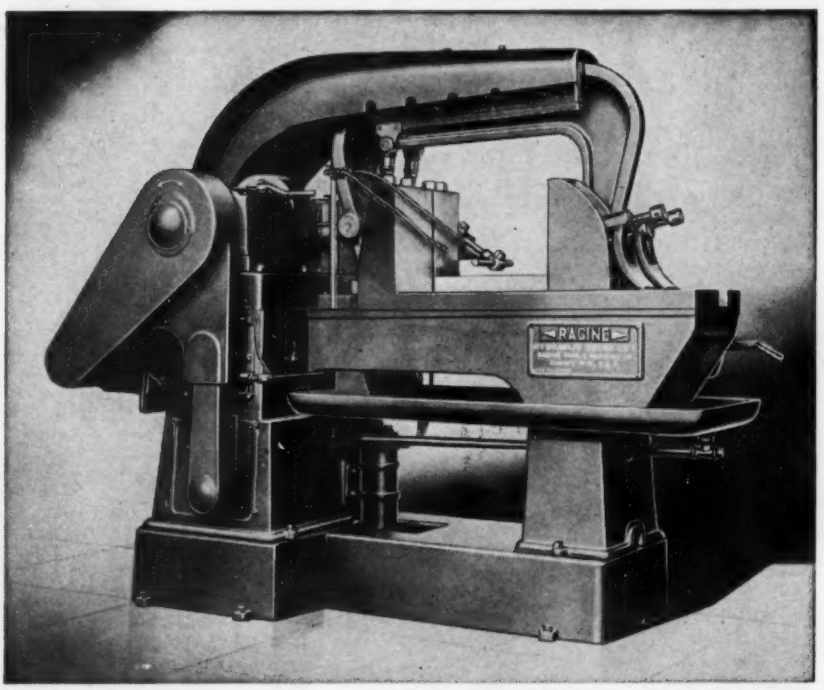
BANDSAW—*Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich.* No pump priming is required for this machine, which handles various shaped pieces up to 8x16 in. flat. July 22, 1943, p. 132.

FILING MACHINE — *Continental Machines, Inc., 1301 Washington Ave. S., Minneapolis, Minn.* File broaching on metals, alloys, plastics, fibers and wood can be performed by the DoAll band filer. Dec. 23, 1943, p. 126.





TUBE CUTTING MACHINE—*De Walt Products Corp., Lancaster, Pa.* All types of straight and angular cut-off operations on tubes, bars and formed and extruded shapes can be performed on this machine with the use of friction saws and abrasive wheels. Nov. 11, 1943, p. 130.



HACKSAW—*Racine Tool & Machine Co., Racine, Wis.* Capacity of this machine for sawing ferrous and non-ferrous metals is 20x20 in.; pieces up to 21 in. wide can be cut from any metal. Dec. 23, 1943, p. 122.

FILING MACHINE—*Connecticut Tool & Engineering Co., 544 Iranistan Ave., Bridgeport, Conn.* The Connecticut universal machine is suited to the precision filing of dies, fixtures, punches, gages, cams and general machine work up to a thickness of 4½ in. Oct. 28, 1943, p. 136.

METAL SAW—*Racine Tool & Machine Co., Racine, Wis.* Light and heavy material can be cut on this machine, which accommodates such armament work as shells, rifles, bomb ends, cannon and gun barrel forgings. Capacities of available machines are from 6x6 to 20x20 in. Sept. 2, 1943, p. 128.

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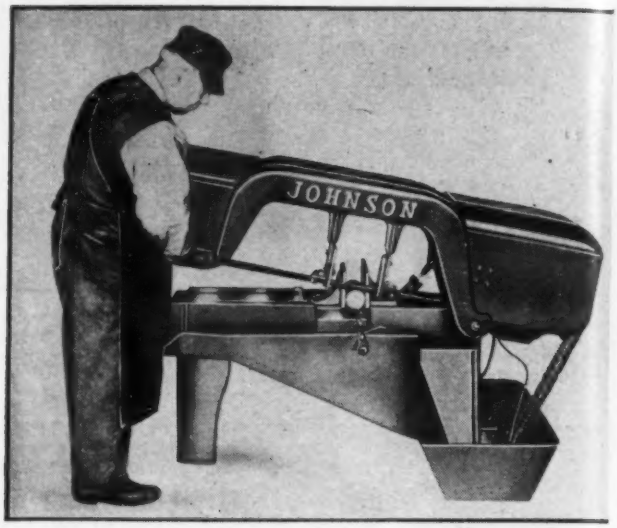
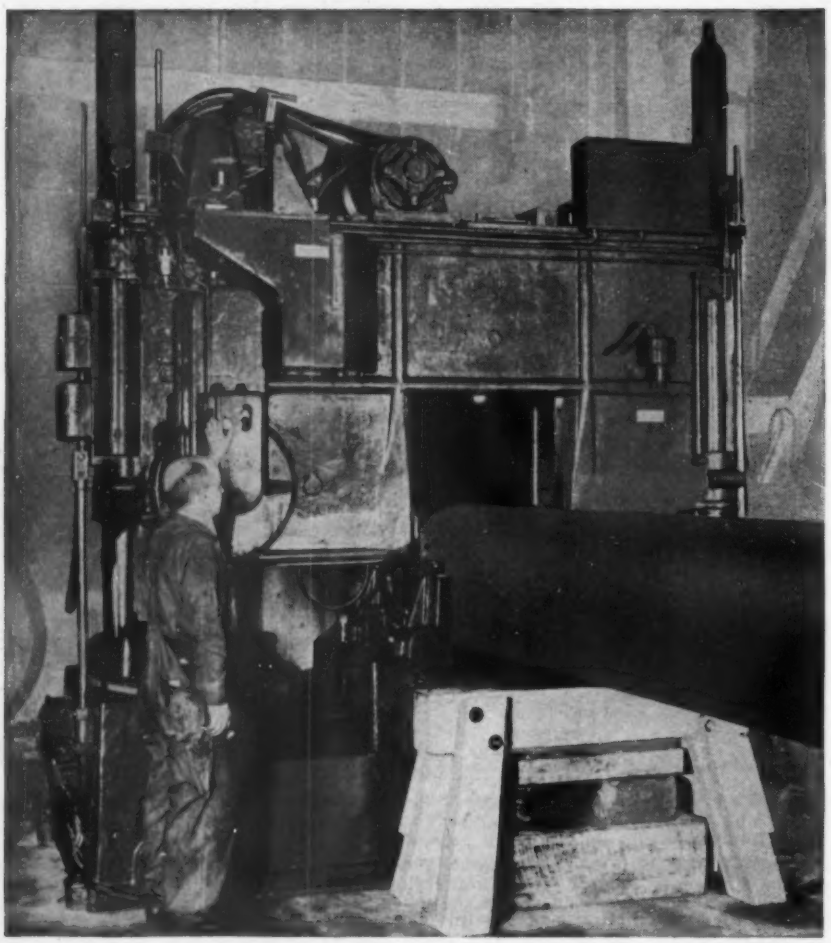


WET-CUTTING SAW—*Johnson Mfg. Corp., Albion, Mich.* The machine is provided with a noiseless cam-driven pump and requires no additional power. By removing pump dry cutting can be performed. July 8, 1943, p. 140.



HACKSAW — *Armstrong-Blum Mfg. Co., 5700 W. Bloomingdale Ave., Chicago 39, Ill.* Maximum capacity of this machine for cutting or trimming large billets, blocks and forgings is 25x26 in. Nov. 25, 1943, p. 125.

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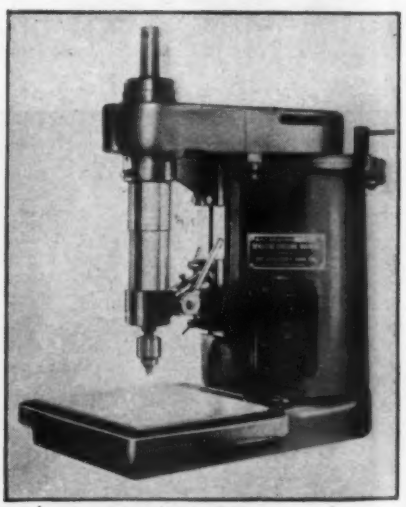

SENSITIVE DRILL—*Sigourney Tool Co., Hartford, Conn.* Two models are available in a single or multiple-spindle design. Maximum distance from table top to chuck on the Model M-100 is 4 in., and on the Model M-100A, 4½ in. Speeds from 4,000 to 10,000 r.p.m. are standard. June 10, 1943, p. 136.

DRILLING MACHINE—*W. F. & John Barnes Co., Rockford, Ill.* Special hydraulically actuated multi-spindle heads are provided in this unit, equipped to drill tank turrets. One type head has 24 spindles and the other 25. Apr. 15, 1943, p. 134.

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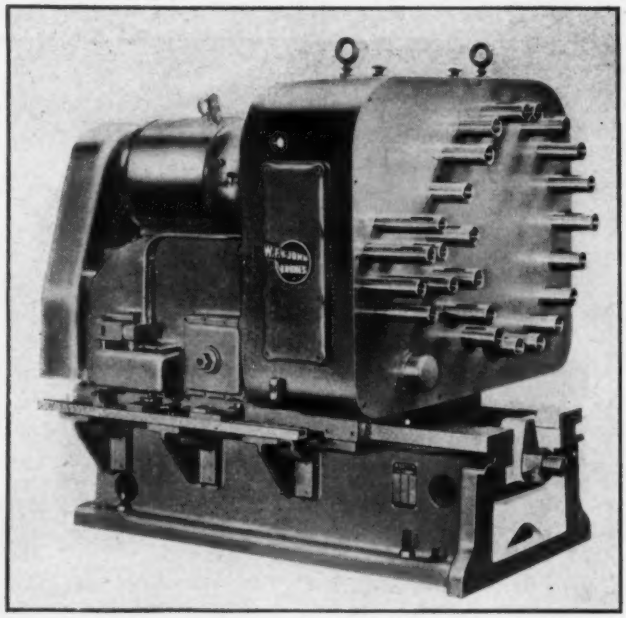
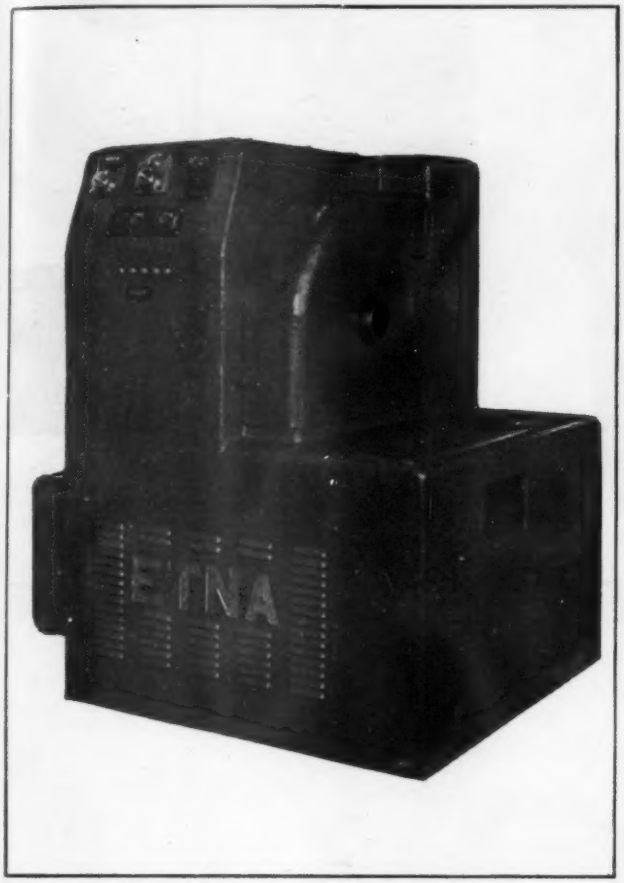
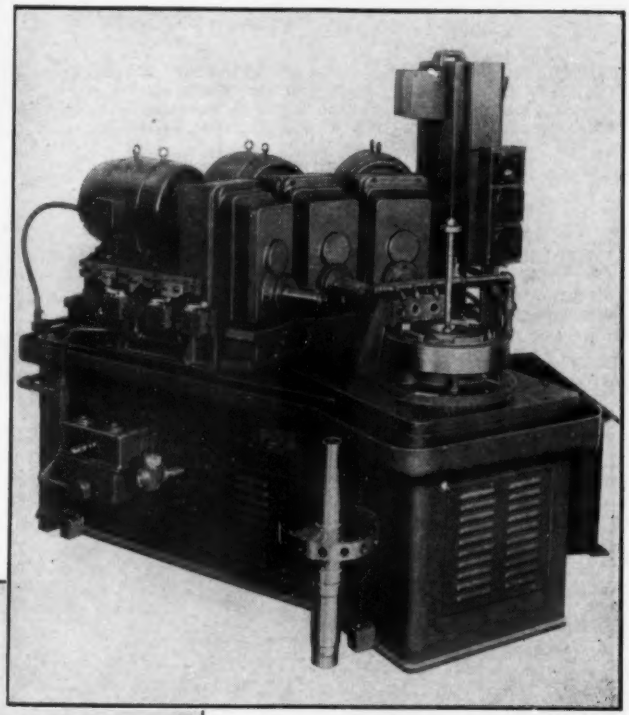
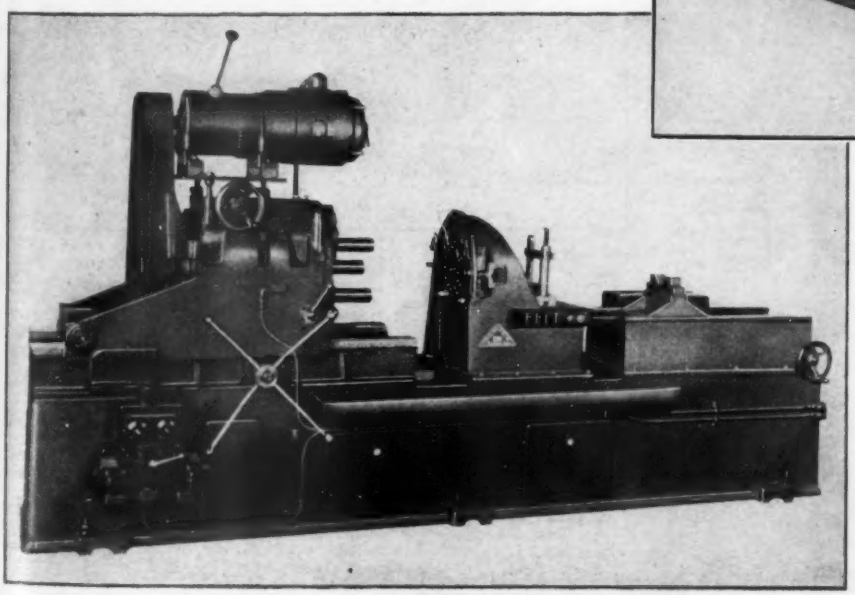




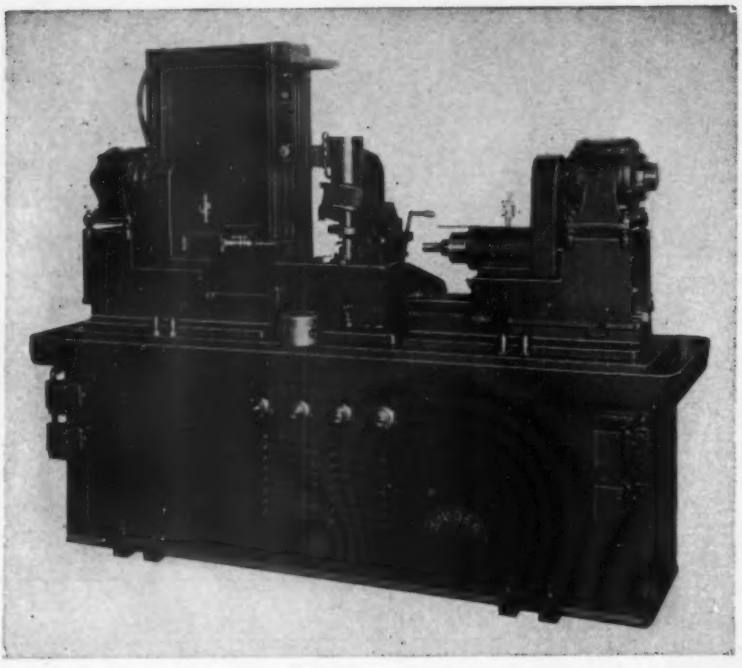
TUBE CUTOFF MACHINE — *Etna Machine Co., 3400 Maplewood Ave., Toledo, Ohio.* This equipment is available in capacities ranging from ½ in. outside diameter, with ⅛ in. wall thickness, up to 12 in outside diameter with 1½ in. wall. Sept. 30, 1943, p. 120.





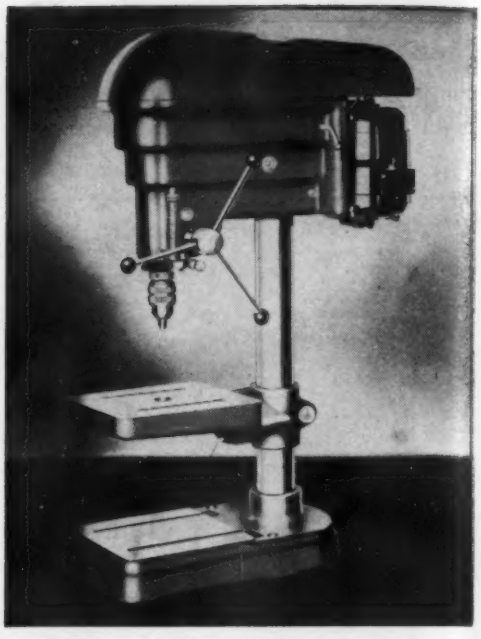
DRILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* Fifteen holes equally spaced around an extended pan on a forged aircraft propeller shaft can be drilled on this special purpose automatic cycle machine. Sept. 16, 1943, p. 134.

DRILLING MACHINE—*LeMaire Tool & Mfg. Co., Dearborn, Mich.* This machine drills, reams and taps holes in flanges of crankshafts having 3, 6 or 12 holes in one setting. Mar. 18, 1943, p. 130.

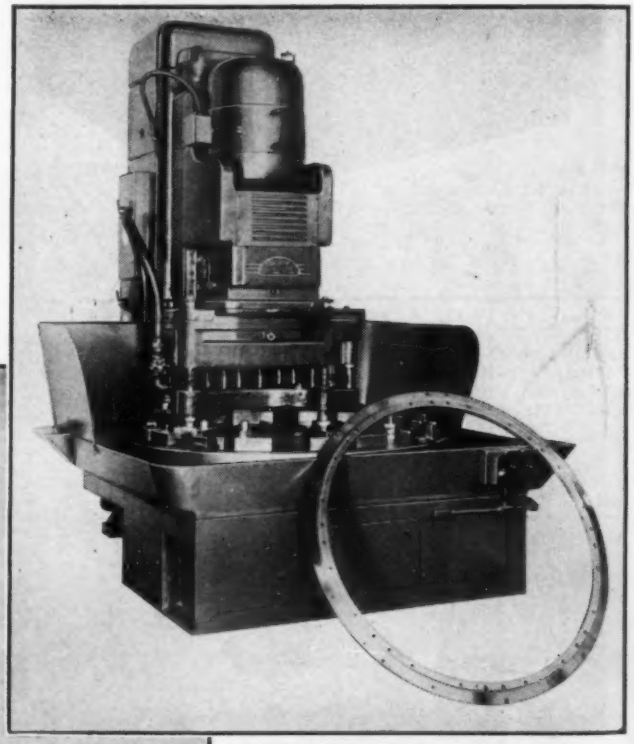


DRILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit, Mich.* Both ends of aircraft piston wristpin holes can be counterbored with this special purpose hydraulic machine. Nov. 25, 1943, p. 132.

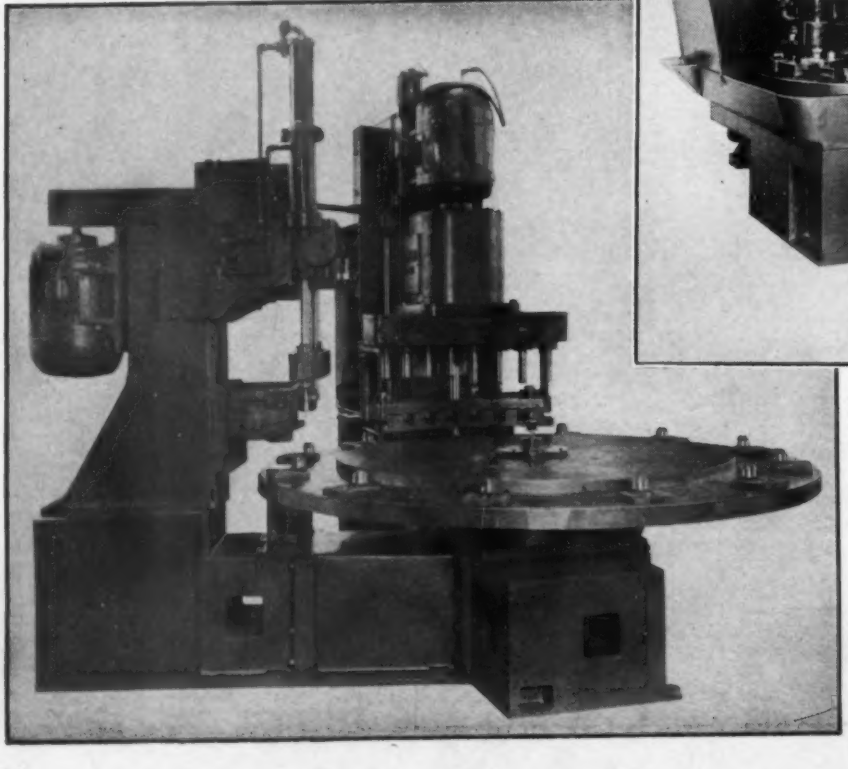
DRILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* This is a single-end horizontal machine for drilling and reaming aircraft parts. Not shown. Feb. 18, 1943, p. 142.



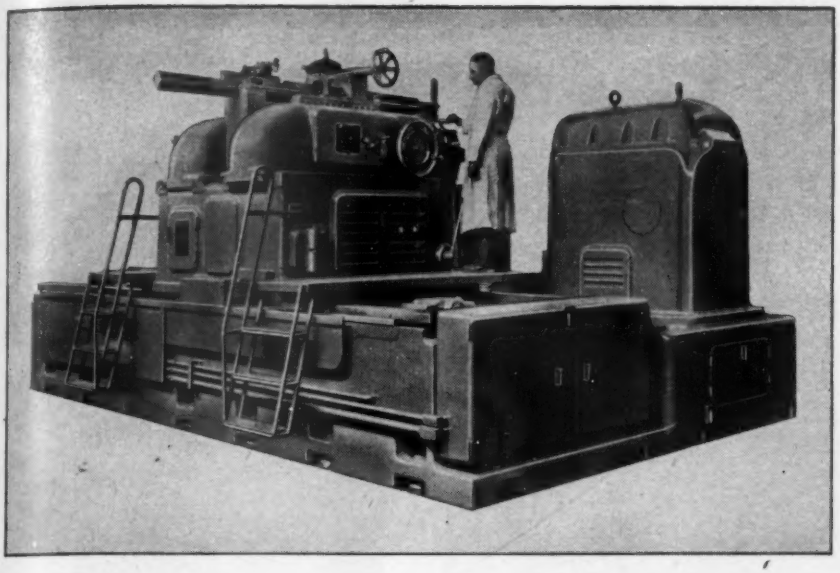
DRILL PRESS—*Boice-Crane Co., 935 Central Ave., Toledo, Ohio.* The 1-, 2-, 3- and 4-spindle helmet head drill press has five predetermined speeds. Available in two sizes. July 22, 1943, p. 129.



DRILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* The standard 20 V 16 drilling, milling and boring machine has been adapted for drilling 56 holes in tank-destroyer turret rings. Sept. 2, 1943, p. 130.



DRILLING MACHINE—*Baker Bros., Inc., Toledo, Ohio.* Special bases and fixtures have been applied to this hydraulic feed machine, developed in three combinations, for performing various operations on tank-turret index rings. Apr. 1, 1943, p. 116.



GEAR SHAVER—*National Broach & Machine Co., 5600 St. Jean Ave., Detroit, Mich.* Gears from 24 to 97 in. in outside diameter can be handled on this Red Ring machine. Three control stations are provided. Oct. 28, 1943, p. 122.

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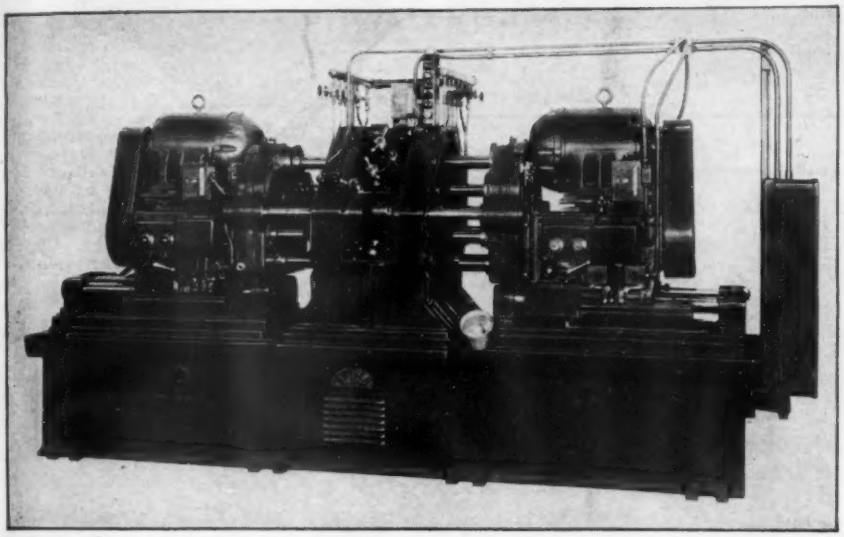
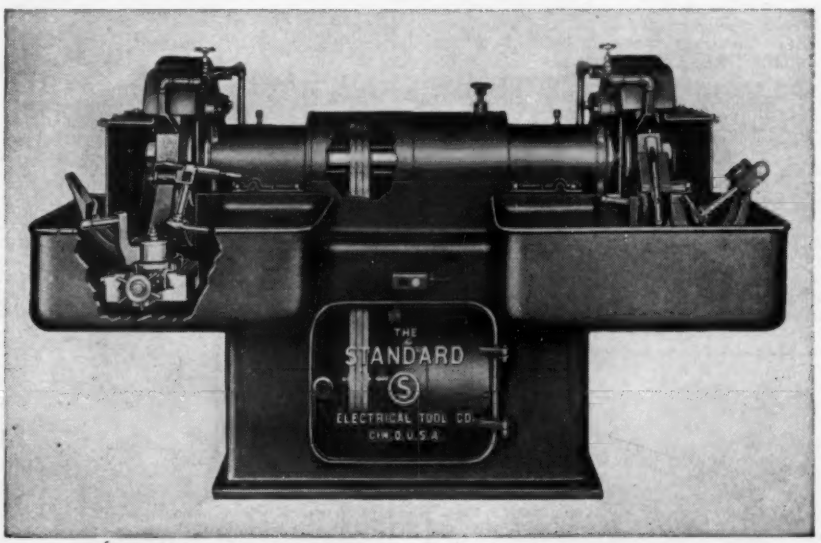
GEAR SHAVER—*Fellows Gear Shaper Co., Springfield, Vt.* Small fine-pitch gears up to 4 in. PD, 20 DP and 1 in. face can be shaved on the No. 4 machine. Sept. 16, 1943, p. 126.

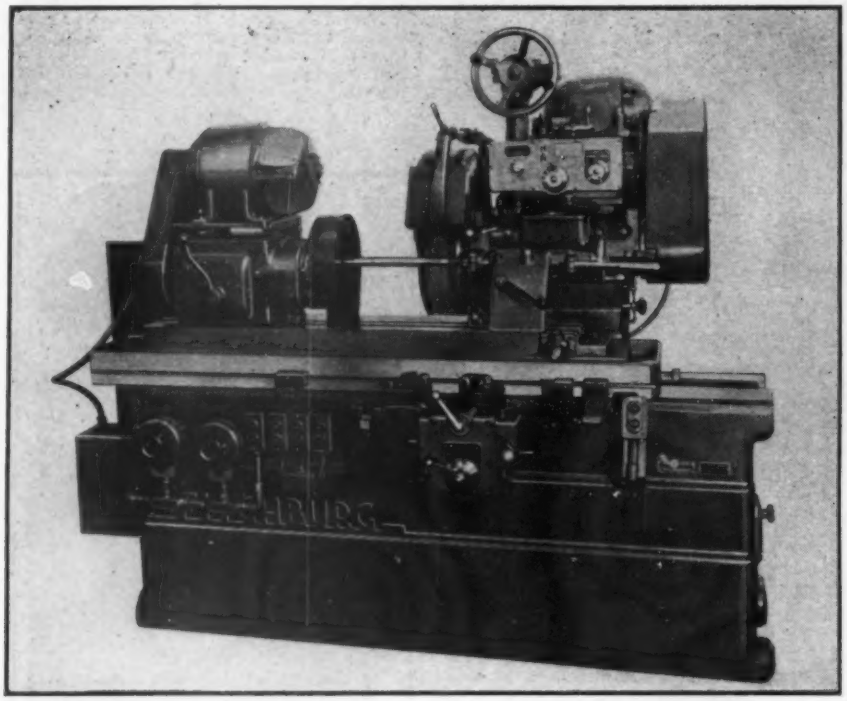


DRILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* Three successive stations are provided for drilling, redrilling and semi-finish boring wristpin holes in aircraft engine pistons on this machine, which has two six-spindle heads. May 13, 1943, p. 142.

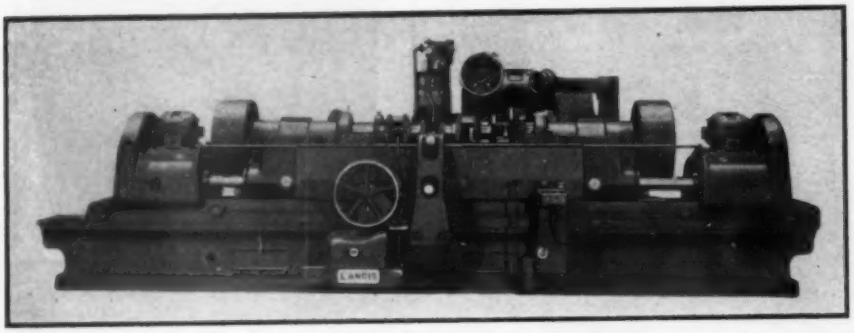
REAMER SHARPENER — *Barber-Colman Co., Rockford, Ill.* A special fixture applied to the company's standard combination sharpening machine results in faster grinding of chambering reamers for 20 mm. and 0.30 and 0.50 cal. guns. Feb. 4, 1943, p. 118.



CHISEL GRINDER—*Standard Electrical Tool Co., 2488 River Road, Cincinnati 4, Ohio.* The machine features a grinder attachment for handling a wide variety of chisel blanks, and is suited also for redressing used chisels. Nov. 25, 1943, p. 130.



CYLINDRICAL GRINDER — *Fitchburg Grinding Machine Corp., Fitchburg, Mass.* Various types of work can be handled on this automatic machine made in 6 and 10 in. sizes, having 9 and 13½ in. swings respectively. Five lengths between centers are available in the two sizes. Aug. 19, 1943, p. 130. ←

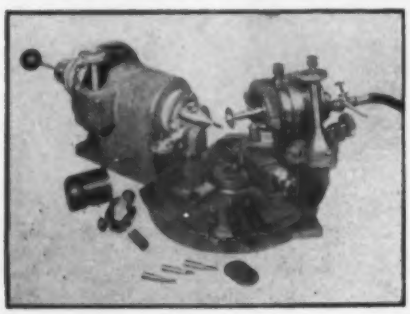


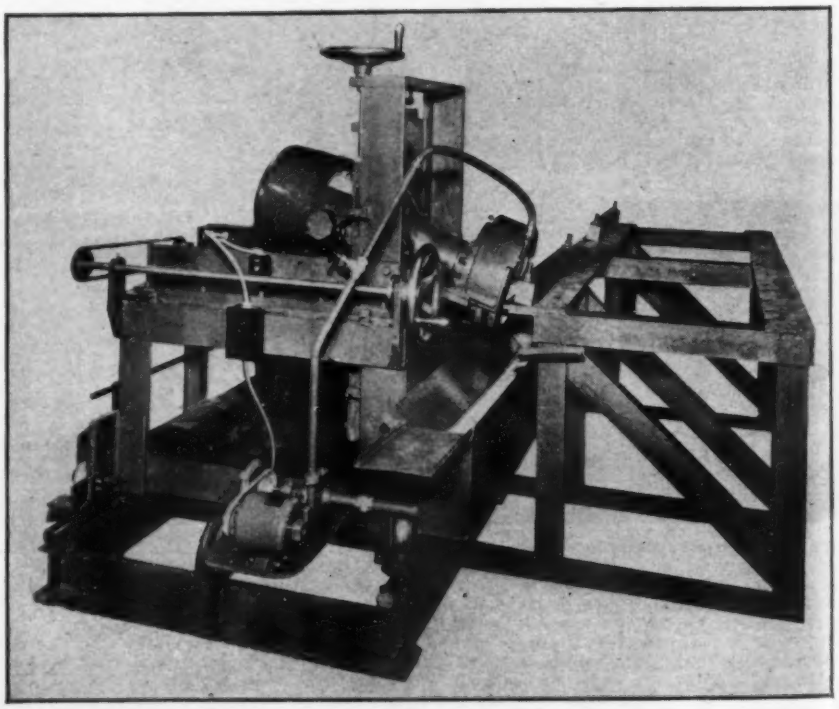
GROOVE GRINDER—*Gear Grinding Machine Co., 3901 Christopher, Detroit, Mich.* Ball grooves from 11/16 to 1 13/16 in. in the outer housing of various sizes of Rzeppa universal joints can be produced on this formed wheel grinder without spindle change. The work oscillates on a swinging head. Oct. 14, 1943, p. 148.

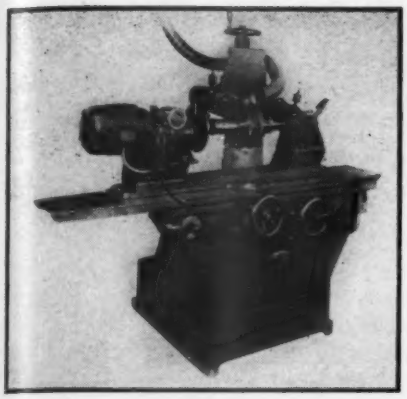
CRANKPIN GRINDER—*Landis Tool Co., Waynesboro, Pa.* Type DD hydraulic crankpin grinder, available in four sizes from 25x48 to 25x120 in., is suited for aircraft engine and smaller diesel crankshafts. A 48 in. diameter wheel is standard. Oct. 14, 1943, p. 150.

ARMOR PLATE GRINDER—*Vonnegut Moulder Corp., 1819 Madison Ave., Indianapolis, Ind.* Straight-line, square and beveled ends and edges of heavy plate can be ground with this machine, which handles work up to 8 ft. in length. The grinding unit has a 90 deg. adjustment. It is moved along the work by a power feed reversing cable drive; feeds up to 8 ft. per min. May 27, 1943, p. 140. →

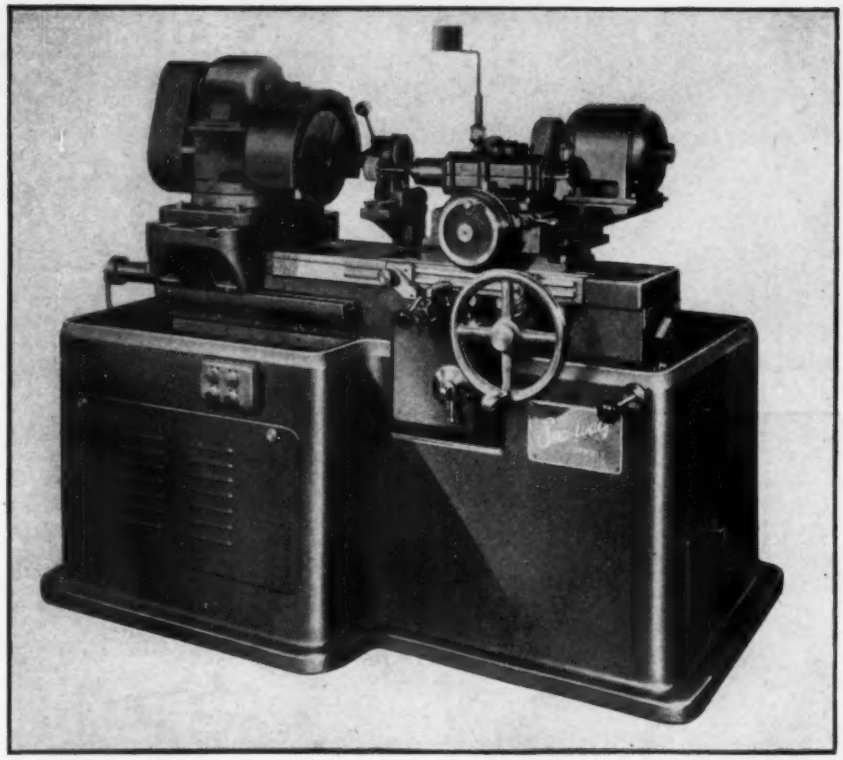
AIR GRINDER — *Onsrud Machine Wks., 3910 Palmer St., Chicago, Ill.* The GF-41 grinder resharpens spiral rotor bits. It is powered by an air turbine motor which operates at 30,000 r.p.m. The entire motor assembly swivels. Adapters permit grinding taper shank bits and ⅛ in. diameter straight shanks. July 22, 1943, p. 138.





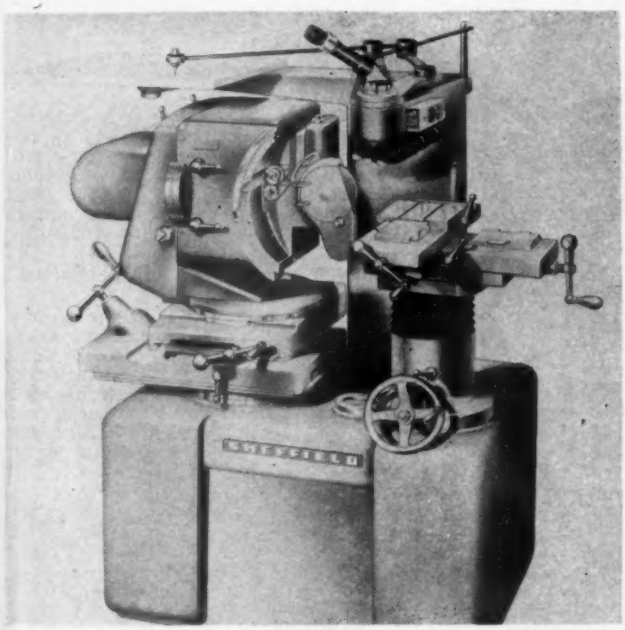


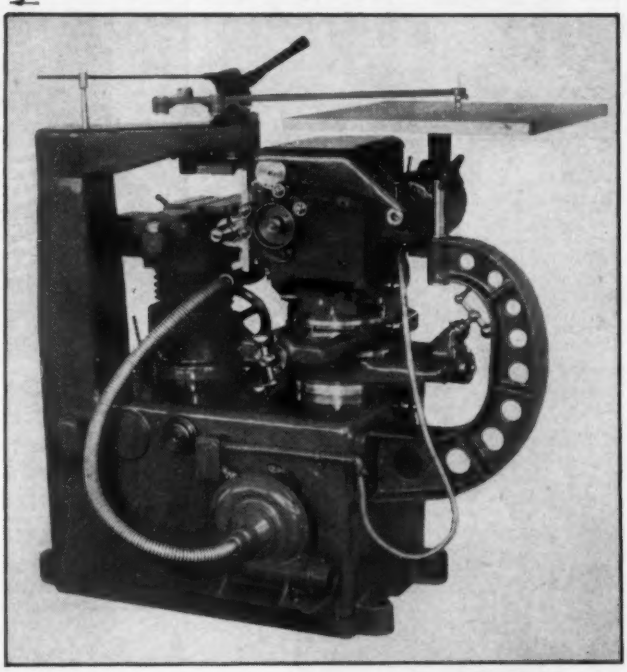
ROLL GRINDER — *Yoder Co., 5500 Walworth Ave., Cleveland, Ohio.* Stepless speed range from 106 to 933 r.p.m. is provided in the Model 100, having a maximum capacity of 16 in. diameter and 20-in. length between centers. Its columns can be rotated 360 deg. Sept. 16, 1943, p. 138.

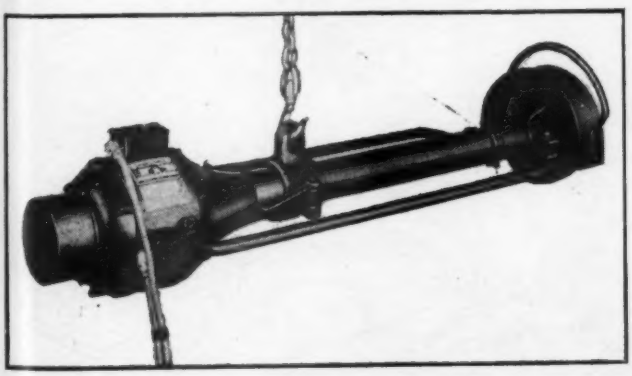


INTERNAL GRINDER—*Sav-way Industries, 4873 E. Eight Mile Rd., Detroit, Mich.* Hand and hydraulic table operations are provided in this machine, which has a maximum table stroke of 24 in. and a minimum of ⅝ in. The two table operations may be used independently or together. May 13, 1943, p. 138.

PROFILE GRINDER—*Sheffield Corp., Dayton, Ohio.* Circular and flat form tools, dies, gages and parts can be finish ground directly from drawings on the Micro-form machine. Work 10 in. wide by 4 in. thick can be handled. It may be used in reverse to produce layout drawings from unknown profiles. Aug. 5, 1943, p. 125.

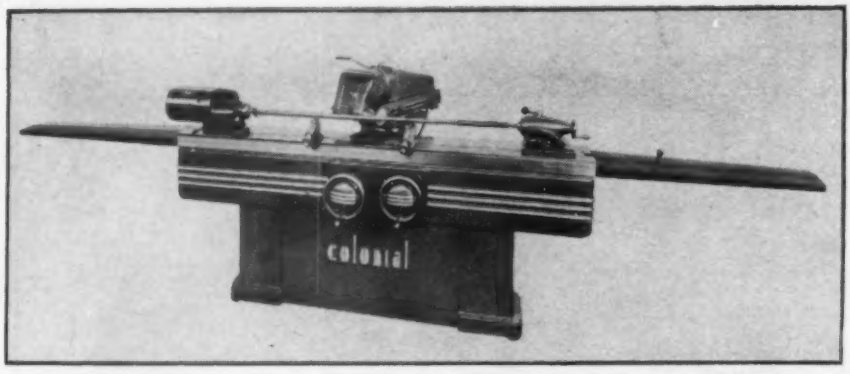






PROFILE GRINDER — *Modern Tool Wks., Ltd., Montcalm Ave., Toronto, Canada.* This optical grinder handles all types of male and female contour gages to 5½ in. long and grinds a thickness of up to 1 5/16 in. to an accuracy of 0.0003 in. Copying system consists of a 50 to 1 pantograph fitted with a 20x microscope. May 13, 1943, p. 133.

GRINDER—*Vonnegut Moulder Corp., 1815 Madison Ave., Indianapolis 2, Ind.* The "in between" grinder suited to reducing seam welds and structural work, can be used in any position, and on all sizes and shapes of castings. A 12x12 in. wheel is used. Sept. 2, 1943, p. 136.



BROACH SHARPENER — *Colonial Broach Co., Detroit, Mich.* Flat broaches up to 65 in. in length between end teeth, and round broaches up to 72 in. between centers and 6 in. overall diameter can be sharpened with this machine. Working table is 99 in. long and 11¼ in. wide. Jan. 7, 1943, p. 113.

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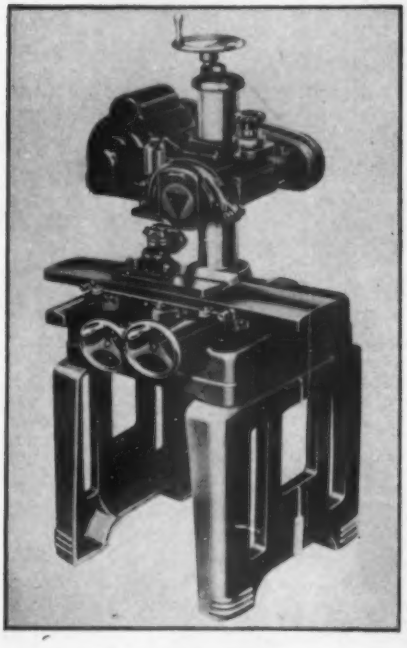

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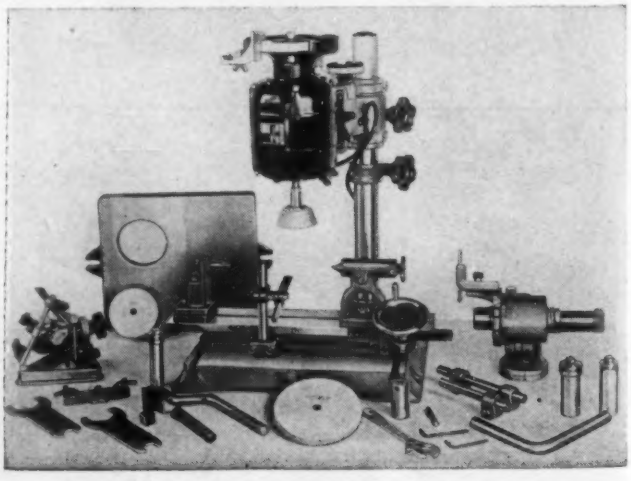
CHIP BREAKER GRINDER—*Delta Mfg. Co., 620 E. Vienna Ave., Milwaukee, Wis.* This chip breaker grinder is suited for grinding the groove in carbide tipped tools, and for form tools, thread chasers or other units up to length of 13½ in., and width of 6 in. By removing vise, the machine can be used as a surface grinder. June 10, 1943, p. 132.

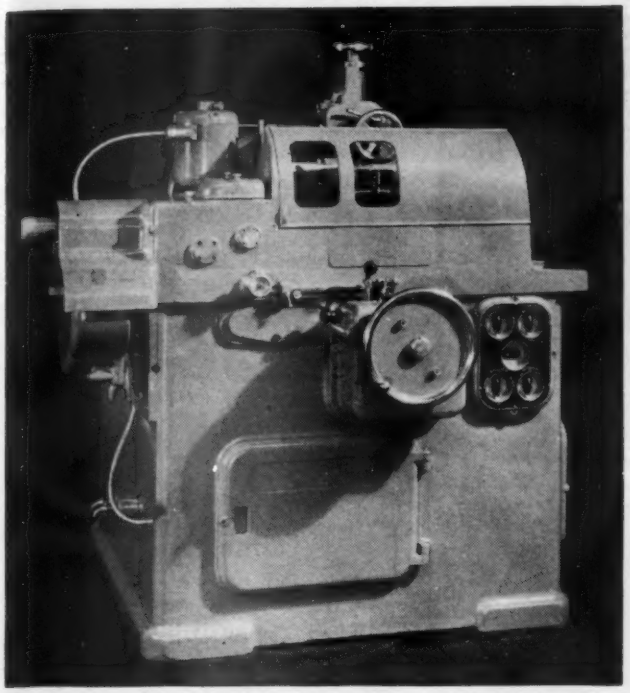
CHIP BREAKER GRINDER—*Carboloy Co., 11149 E. Eight Mile Rd., Detroit 32, Mich.* This machine for grinding chip breakers in single point tools and roller turner tools can also grind flat form tools and round or square boring bits. Aug. 19, 1943, p. 132.

CUTTER GRINDER — *Douglas Machinery Co., 150 Broadway, New York, N. Y.* The Rotorex universal tool and cutter grinder, with 8 in. swing over the table, is adaptable to use on milling cutters, hobs, saws, reamers and other tools. Spindle speeds of 3,000 to 6,000 r.p.m. are provided. Apr. 15, 1943, p. 129.

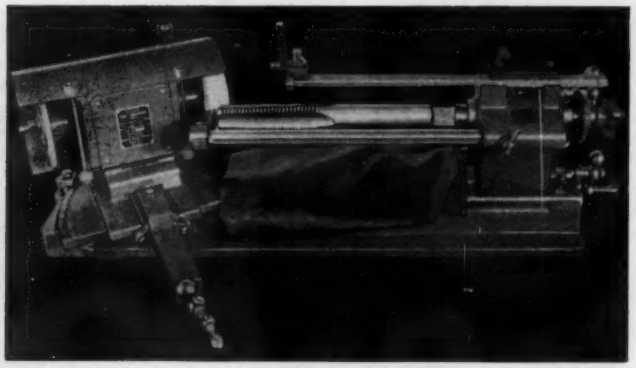
CUTTER GRINDER—*Covel Mfg. Co., Benton Harbor, Mich.* The No. 12 universal tool and cutter grinder is built to handle a variety of operations through the use of a number of attachments. Three speeds are available. Sept. 30, 1943, p. 120.

CUTTER GRINDER — *Roan Mfg. Co., 1225 Washington Ave., Racine, Wis.* This tool and cutter grinder handles most types of cutting tools and can be used for contour grinding. The head may be raised, lowered or swiveled. Various attachments are provided for grinding different types of tools. May 13, 1943, p. 134.

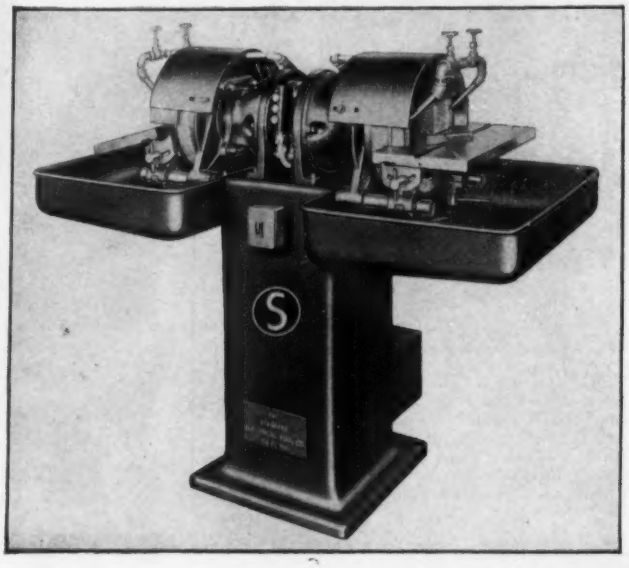




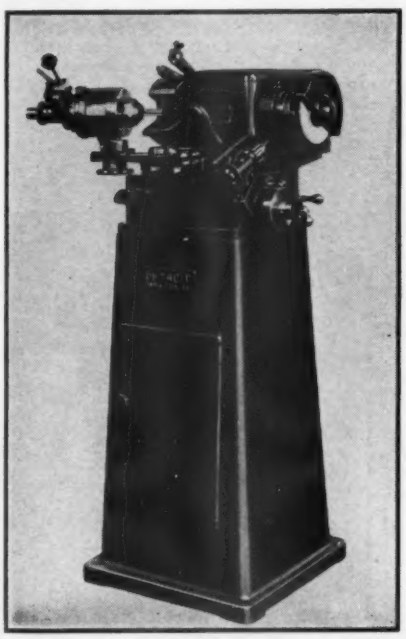
THREAD GRINDER—*Sheffield Corp., Dayton 1, Ohio.* Single, multiple, right- or left-hand threads with any pitch up to 60 threads per inch can be produced on work up to 7 in. diameter with this machine. Seven cutting speeds are available, turning the work from 0.83 to 7.5 r.p.m. Sept. 2, 1943, p. 125. →



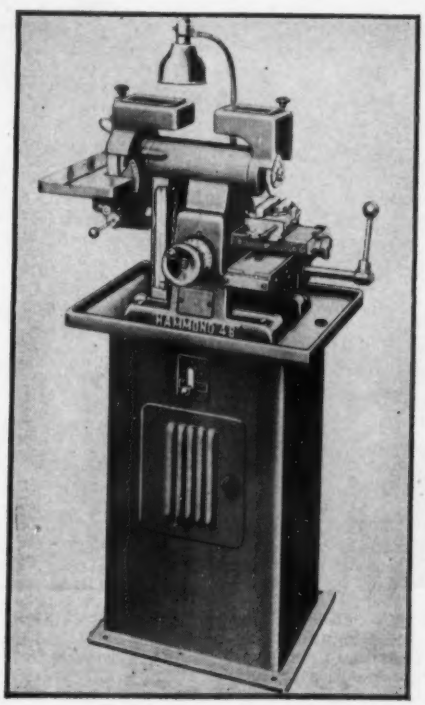
TAP GRINDER—*Edward Blake Co., 634 Commonwealth Ave., Newton Centre, Mass.* Chamfer on taps up to 2 in. diameter and 14 in. long can be sharpened on the No. 2 tap grinder. Change gears are provided for sharpening 2, 3, 4, 5, 6, 8 or 10 flutes, right or left hand. Sept. 2, 1943, p. 136.



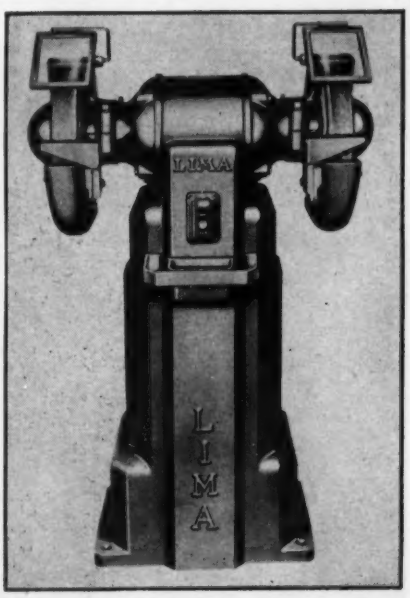
TOOL GRINDER — *Standard Electrical Tool Co., 2488 River Rd., Cincinnati, Ohio.* This 3-hp., 14-in. carbide tool grinder, for either wet or dry grinding, has a wheel speed of 1,150 r.p.m. It is also available in smaller sizes. Apr. 1, 1943, p. 114.



TAP RECONDITIONER—*Detroit Tap & Tool Co., 8432 Butler, Detroit 11, Mich.* The improved design features a spindle head which meets various service factors. The machine handles taps from 1¼ in. shank size down to the smallest machine screw size. Oct. 28, 1943, p. 128.

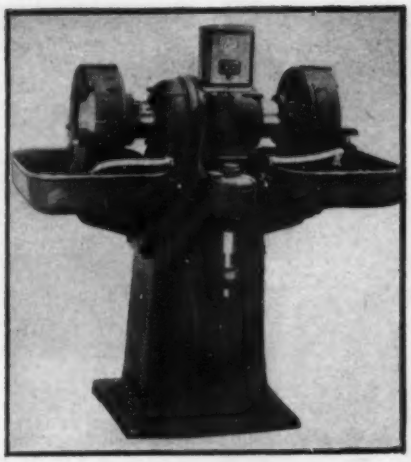


TOOL GRINDER — *Hammond Machinery Builders, Inc., 1618 Douglas Ave., Kalamazoo, Mich.* This belted type machine is a combination chip breaker and cup wheel grinder. A feature is the double-cradle any-angle vise. Wheels of 4 or 6 in. diameter are accommodated on the chip breaker side. Apr. 1, 1943, p. 118. →

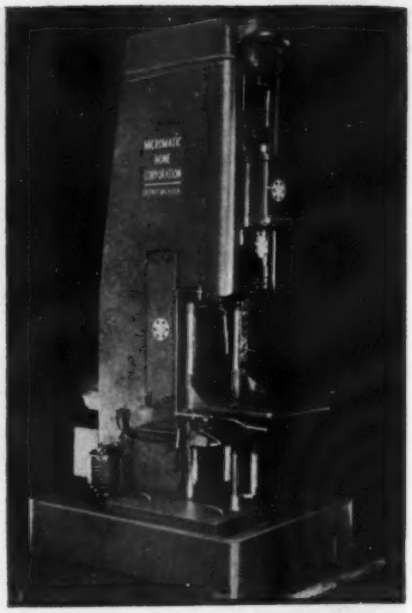


TOOL GRINDER—*Lima Electric Motor Co., Lima, Ohio.* Size of the 24S pedestal type is 29½ in. wide; while the 25S is 35⅝ in. wide. Capacities are 2 and 3 hp. Wheel arbor diameter is 1¼ in. Feb. 18, 1943, p. 144.

TOOL GRINDER—*J. G. Blount, Everett, Mass.* The Model B wet grinder handles all hard metal, special alloys and tungsten carbide. Spindle speed of 1,750 r.p.m. is available, using steel-backed cup wheels 12 in. in diameter by 2 in. face. May 27, 1943, p. 138. →



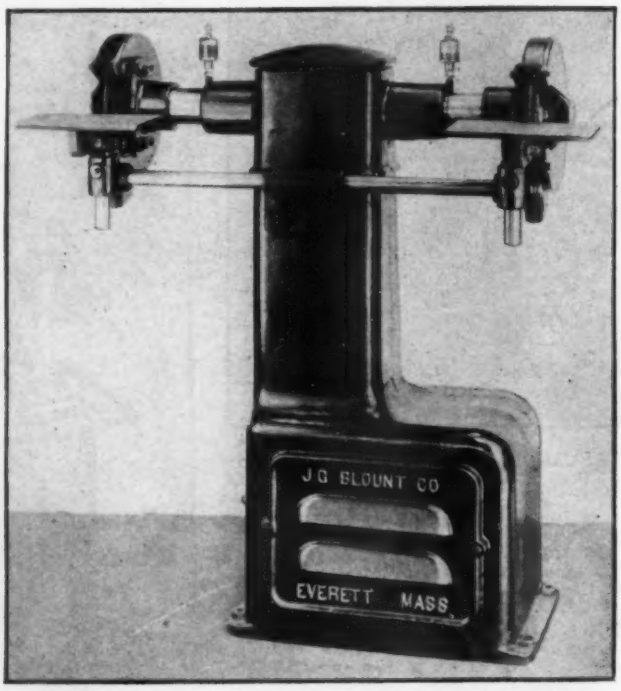
TOOL GRINDER—*Thomas Prosser & Son, 120 Wall St., New York 5, N. Y.* Model AA floor type carbide tool grinder features a quick-acting indexing device, 7-in. wheel, and attachments for grinding chip breakers and sharpening various size drills. Apr. 29, 1943, p. 118.



HONING MACHINE — *Micromatic Hone Corp., Detroit, Mich.* The vertical honer is available in one model with capacity from ¼ to ⅞ in. diameter and another from ⅞ to 2 in. Both handle work up to 12 in. long and have a maximum stroke of 15 in. May 27, 1943, p. 134.

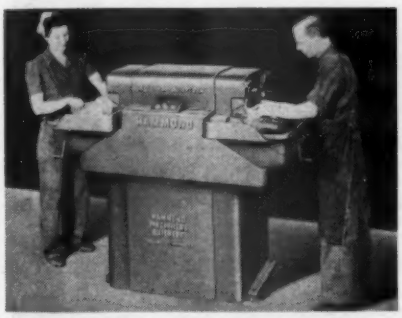
TOOL GRINDER—*J. G. Blount Co., Everett, Mass.* All hard metal, special alloys, and tungsten carbide can be ground on the Model H 30-in. which has a wheel speed of 720 r.p.m. Mar. 18, p. 125.

LAPPING MACHINE—*Gardner Machine Co., Beloit, Wis.* Sizes range from 12 to 72 in. The machine is adaptable to a variety of single-surface parts. Cast iron lapping plates are used on the small sizes, and standard steel wheel on the large sizes. Jan. 1, 1943, p. 118.

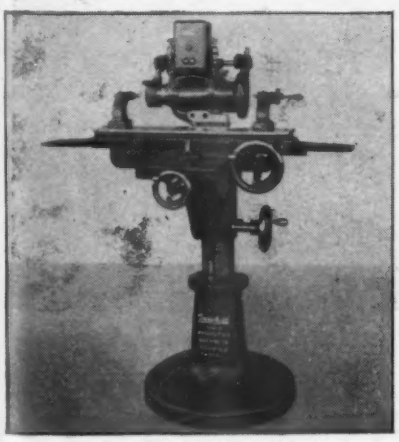


TOOL GRINDER—*J. G. Blount Co., Everett, Mass.* The Model H.S. 10-in. grinder is suited for tap flutes, bevel edge grinding on clicker dies, gear tooth polishing and cutting off steel tools. Maximum wheel size is 10x½ in. and minimum thickness is ⅛ in. Apr. 29, 1943, p. 126.

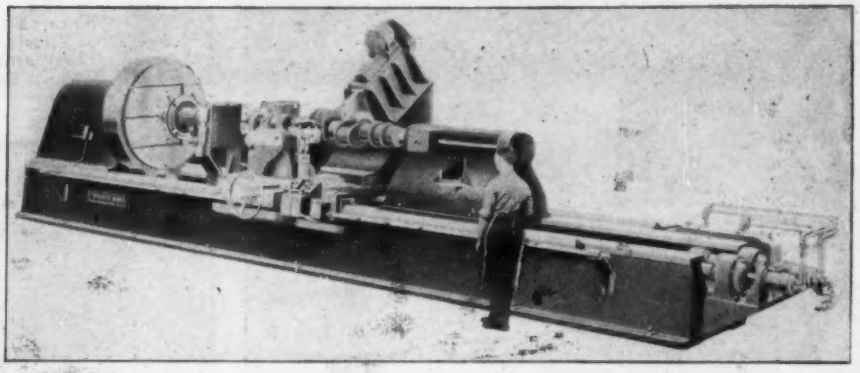
TOOL GRINDER—*Thomas Prosser & Son, 120 Wall St., New York 5, N. Y.* The improved Model EE heavy-duty carbide tool grinder can be supplied for rough or dry grinding; includes quick-acting indexing tables. Any combination of wheels may be used. Drill grinding attachments can be furnished. Oct. 14, 1943, p. 156.



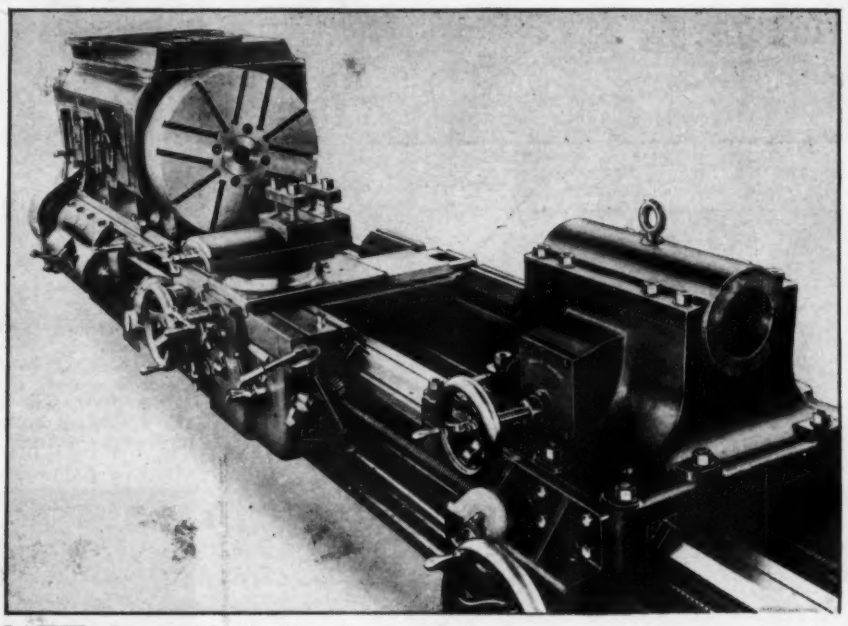
TOOL GRINDER—*Hammond Machinery Builders, Inc., 1618 Douglas Ave., Kalamazoo 54, Mich.* The line of 10- and 14-in. Wet-N-Dry carbide tool grinders offer coolant control for wet grinding. Dec. 9, 1943, p. 120.



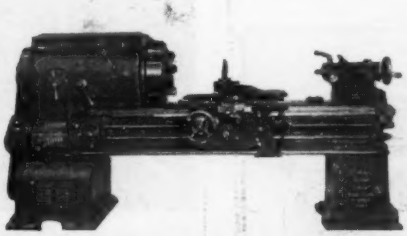
TOOL GRINDER — *Production Machine Co., Greenfield, Mass.* This company has developed the No. 4 plain tool and cutter grinder and the No. 4U universal type. Swing over table is 6¼ in. and 9 in. respectively. A cylindrical grinding attachment is available for use with the universal type. Feb. 4, 1943, p. 120.



CRANKSHAFT LATHE—*Wickes Bros., Saginaw, Mich.* The Model UH-60 single-end drive heavy-duty universal type lathe machines mail line bearings and ends of diesel shafts having line bearings up to 10 in. diameter. A three-way turret is mounted on the cross-slide. Swing over the bed is 61 in. and over the cross-slide, 36 in. Feb. 4, 1943, p. 114.

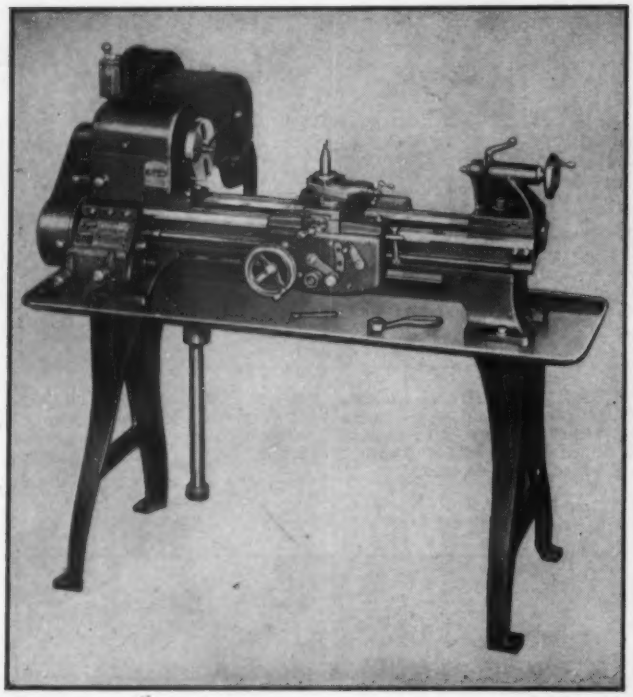


LATHE—*Sommerfeld Machine Co., Braddock, Pa.* Two machines are available for large diameter work. The BT for boring and turning simultaneously and type T for turning only. Available in 50- and 60-in. sizes in any bed length. Swing over the ways is 53 and 60 in. respectively. May 27, 1943, p. 136.



LATHE—*Lehmann Machine Co., Chouteau at Grand, St. Louis 3, Mo.* The Hydratrol 18 in. size has been added to the line of large hollow spindle lathes. Nov. 11, 1943, p. 128.

LATHE—*Wade Tool Co., Waltham, Mass.* A steel cabinet mounting is provided for the No. 8A toolmakers' lathe. This is a backgeared machine with 1-in. collet capacity and 12 speeds from 25 to 2,000 r.p.m. May 13, 1943, p. 142.



LATHE—*Logan Engineering Co., 4901 Lawrence Ave., Chicago, Ill.* This quick-change gear lathe with 10½ in. swing over bed and 24 in. between center, features an automatic apron. Sept. 2, 1943, p. 134.
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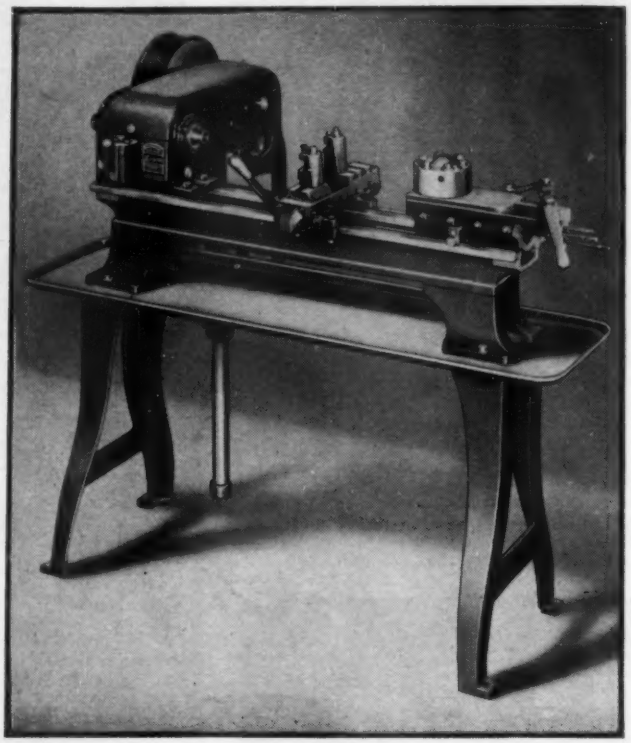
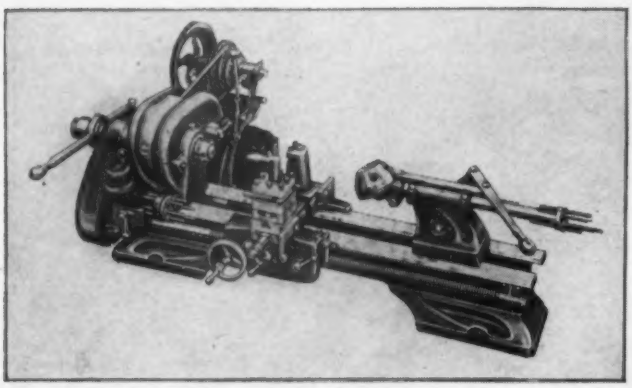
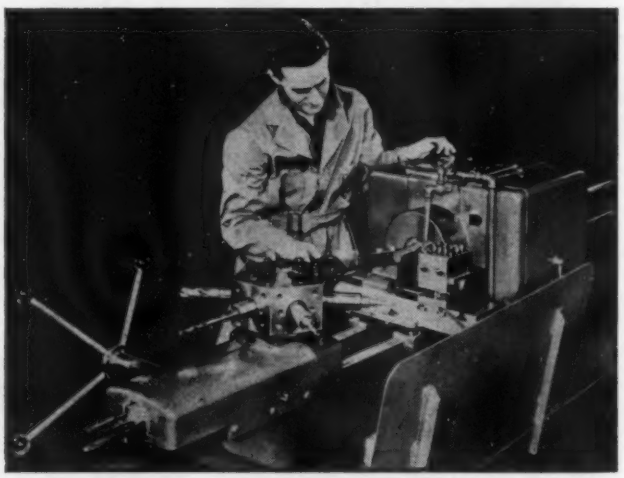


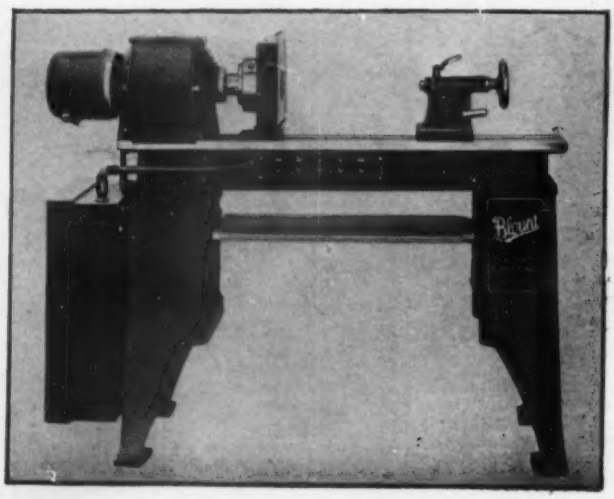
HAND SCREW LATHE—*Logan Engineering Co., 4912 Lawrence Ave., Chicago, Ill.* Round bar stock capacity is ⅝ in. diameter. Turret holes are bored from the headstock. Speed collet chuck and bar feed attachment are offered as accessories. Mar. 4, 1943, p. 130.



LATHE—*Atlas Press Co., Kalamazoo, Mich.* This 10-in. machine may be converted for hand-type screw machine operations by adding independent or universal chucks. It has 10¼ in. swing over the bed, collet capacity of ½ in. and 16 spindle speeds. Four bed lengths are available. Apr. 15, 1943, p. 132.

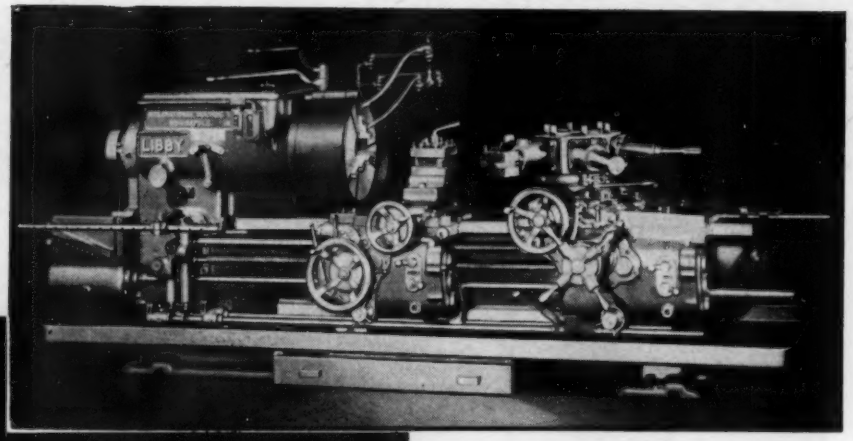


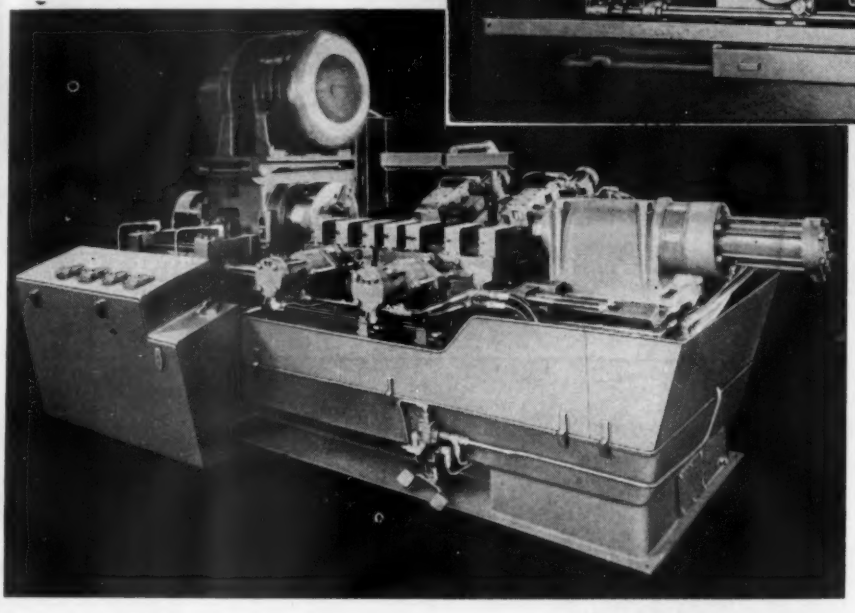
TURRET LATHE—*Oster Mfg. Co., 2057 E. 61 Pl., Cleveland, Ohio.* The No. 601 Rapiduction turret lathe is now equipped with an automatic indexing 6-station turret. Capacity is 1½ in. round for cutting off, boring, packing, reaming, facing, threading and other operations. When three or less operations in sequence are required the machine can be furnished with plain saddle. Jan. 7, 1943, p. 114.



LATHE—*J. G. Blount Co., Everett, Mass.* The Model B-2 headstock lathe is provided with an automatic brake for quick stopping and includes a manual spindle release. It has a 12-in. swing by 4 ft. bed, but can be supplied with 16- or 18-in. swing. Apr. 15, 1943, p. 132.

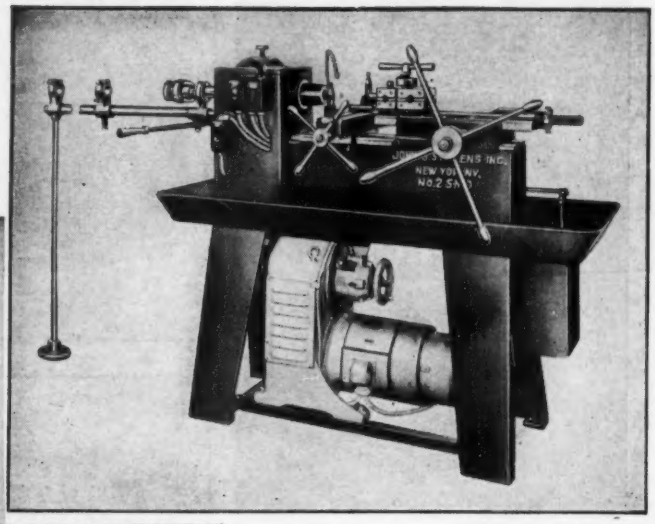
TURRET LATHES — *International Machine Tool Corp., Libby Div., Indianapolis, Ind.* The new standardized line includes five sizes each of Type H heavy-duty turret lathes and fixed bed types; a sliding-bed gap machine with 84-in. swing and a special sliding-bed gap machine with 150-in. swing. Sept. 16, 1943, p. 125.

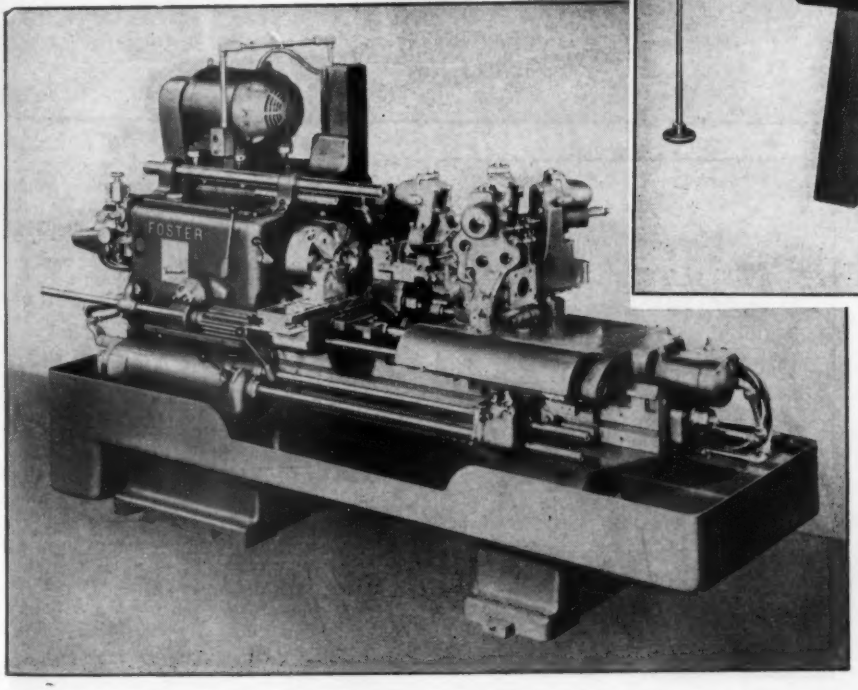




LATHE—*Sparks Machine Tool Corp., 32-34 Main St., Norwalk, Conn.* This special-purpose semi-automatic Hydrafeed machine handles mass production of shell, tank, automotive and aircraft parts. All tool movements are hydraulically controlled. Swing is 21 in. over the ways and 12 in. over the carriage, with bed lengths either 7 or 9 ft. Apr. 29, 1943, p. 118.

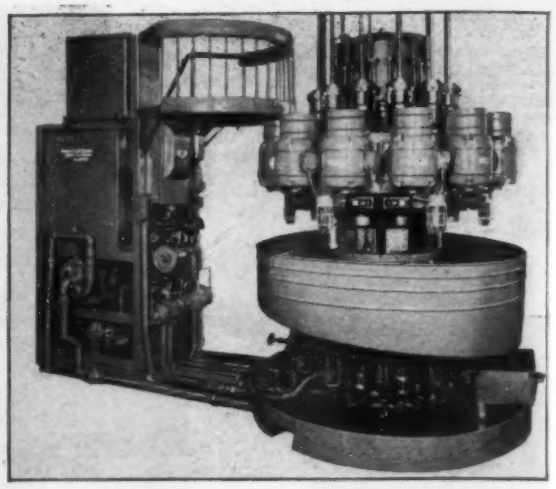
SCREW MACHINES—*John B. Stevens, Inc., 480 Canal St., New York, N. Y.* Stepless speed variation is featured in the Nos. 1 and 2 screw machines, with bar capacity of ⅝ and 1⅛ in. respectively. Three and 6-in. lengths can be machined. No. 1 has a swing over the bed of 9 in.; the No. 2, 10½ in. June 10, 1943, p. 128.



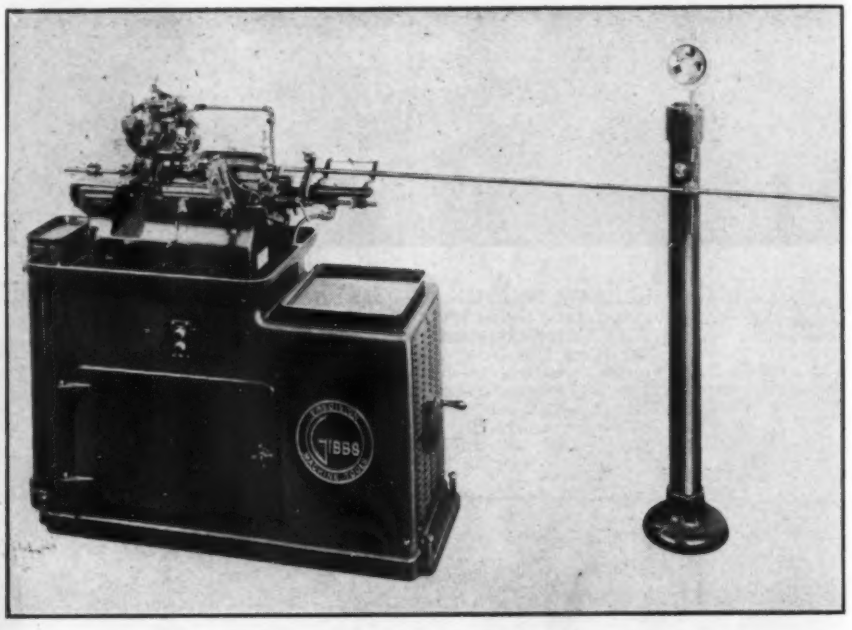


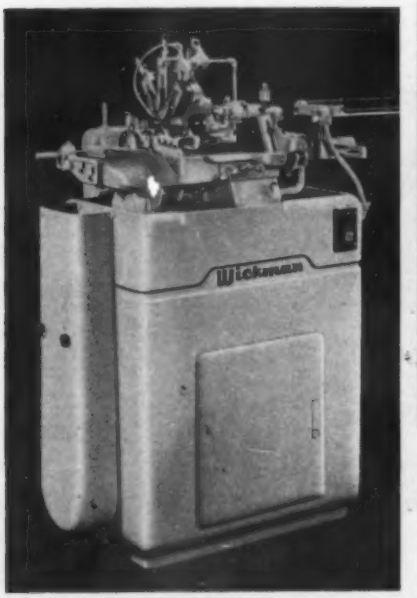
TURRET LATHES — *International Machine Tool Corp., Foster Div., Elkhart, Ind.* The Nos. 1-F and 2-F Fastermatics have independent turret face feeds and are built to perform multiple cutting operations and various combinations of machine movements in automatic cycles. The 1-F has 27 and the 2-F 28 spindle speeds from 22 to 332 and 17 to 263 r.p.m. respectively. Feb. 18, 1943, p. 138.

AUTOMATIC SCREW MACHINE — *George Gorton Machine Co., Racine, Wis.* The 16-A Swiss-type automatic is an American development of the Swiss Petermann P-7 machine. Tooling for the Gorton and Petermann machines is interchangeable. Diameters from 0.005 to 7/16 in. are handled in lengths from 1/32 to 2¾ in. June 24, 1943, p. 125.

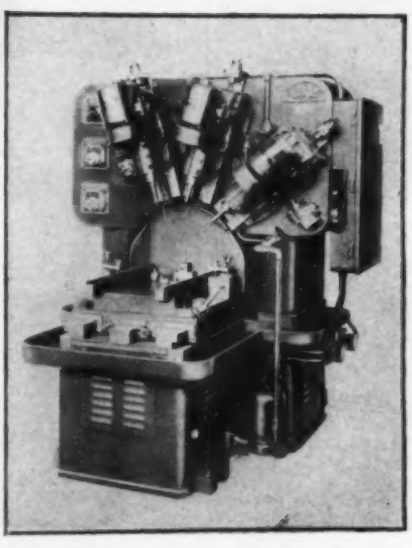


VERTICAL SCREW MACHINE — *C. I. Togstad Co., Machine Tools Div., Kokomo, Ind.* This automatic bar feed and chucking machine handles parts of round, square or hexagon bar stock up to 12 in. through the collet. Collet capacities are: round, 2 in.; hexagon, 1¾ in., and square, 1 7/16 in. May 27, 1943, p. 138.





AUTOMATIC SCREW MACHINE — *Wickman Corp., 15533 Woodrow Wilson Ave., Detroit, Mich.* The No. 1 Swiss-type automatic has 5/32 in. diameter bar capacity and will turn lengths up to 1 3/16 in. Tolerances of ± 0.0002 in. can be held on diameter and concentricity. June 10, 1943, p. 125.



AUTOMATIC SCREW MACHINE — *Thomas B. Gibbs & Co., Delavan, Wis.* A wide range of diameter, form, taper and radii turning, including milling operations can be performed in one cycle on this machine. Bar capacity is ⅝ in. and the machine will turn parts having a maximum length of 2½ in. Aug. 19, 1943, p. 129.

SPECIAL MILLER—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* Binder bar slots in aircraft cylinder heads are milled on this special automatic machine, which cuts slots in three fin sections at one time. Aug. 5, 1943, p. 126.

SPECIAL MILLER—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* This two-spindle automatic machine is designed to mill valve clearance on aircraft pistons. Three stations are provided, one for loading and two for working. Not shown. Jan. 7, 1943, p. 120.

Machine Tapers—I

THIS AMERICAN STANDARD for self-holding and steep tapers was jointly sponsored by the American Society of Mechanical Engineers, The National Machine Tool Builders Association and the Society of Automotive Engineers. The standard embraces a revision of the self-holding tapers approved in 1937 and six preferred and six intermediate steep tapers.

The self-holding taper series consists of 22 sizes—the first three having the Brown & Sharpe taper of 1/2 in. per ft.; the next eight the Morse taper of approximately 5/8 in. per ft., and the last eleven sizes a taper of 3/4 in. per ft.

In the case of taper shank rotating tools or arbors, some means must be provided for transmitting rotary motion of the machine spindle to the tool. Either friction or positive drive can be used. The latter is preferable, and is obtained by providing a tongue on the shank and a slot in the socket, or keyways in both shank and socket with radial keys to transmit the torque.

To maintain proper alignment, the tool shank must be seated firmly in the socket, and securely locked under certain conditions, particularly with the larger sizes. Friction, a hold-back key or a drawbolt may be used for the purpose.

Tables 2 to 5 inclusive give detailed dimensions and tolerances for self-holding taper shanks and sockets, classified according to the means of: (1) transmitting torque, and (2) retaining the shank in the socket:

Table 2—Tang drive with shank held in by friction

Table 3—Tang drive with shank held in by key

Table 4—Key drive with shank held in by key

Table 5—Key drive with shank held in by drawbolt

Nomenclature

Basic Size—The theoretical size from which all variations are allowed.

Drift or Drift Key—A flat tapered bar for forcing the taper out of its socket.

Drift Keyslot—A slot through the socket at the small end of the tapered hole to receive a drift or tapered key for forcing drills out of the socket.

Exposed Length—The distance the large end of the shank projects from the drive in socket or gage.

Gage Line—The basic diameter at or near the large end of the taper.

Holdback Keyslot—A keyslot cut through both the socket and tool shank to receive a key which holds the tool in place and may help to drive it.

Keyslot—A slot through the drill shank, drill socket or drill gage.

Key Drive—A method of driving the tool by a holdback key through the shank and the collet or an external rectangular key.

Over-All Length of Shank—Total length from large end of taper to end of tang.

Relief—Reduction in diameter of the small end of shank.

Self-Holding Taper—A taper with an angle small enough to hold a shank in place ordinarily by friction without other holding means. (Sometimes referred to as slow taper.)

Shank—The tapered part of a drill or other tool which serves to center the tool in the socket on the spindle of the machine tool and insures the rotation of the tool with the socket.

Steep Taper—A taper having an angle sufficiently large to insure the easy or self-releasing feature.

Socket—The part of a machine tool spindle which is designed to receive and hold the tapered shank of a drill, other tool or arbor.

Tang—The flattened end of the taper shank.

Tang-Drive—A means of driving a tool by a tang (or tongue) on the end of the shank.

Taper per Foot—The difference in diameter between two points 12 in. apart measured along the axis.

Tolerances—The total amount of variation permitted in the size of a part. The tolerances on various dimensions are unilateral or bilateral as shown with the several tables.

Tongue—See tang.

TABLE 1 — Self-Holding Tapers Basic Dimensions

No. of Taper	Taper per Foot	Diameter at Gage Line[1] A	Origin of Series
.239	0.50200	0.23922	Brown and Sharpe Taper Series
.299	0.50200	0.29968	
.375	0.50200	0.37525	
1	0.59858	0.47500	Morse Taper Series
2	0.59941	0.70000	
3	0.60235	0.93800	
4	0.62326	1.23100	
4 1/2	0.62400	1.50000	
5	0.63151	1.74800	
6[2]	0.62565	2.49400	
7[2]	0.62400	3.27000	
200	0.750	2.000	3/4 Inch per Foot Taper Series
250	0.750	2.500	
300	0.750	3.000	
350	0.750	3.500	
400	0.750	4.000	
450	0.750	4.500	
500	0.750	5.000	
600	0.750	6.000	
800	0.750	8.000	
1000	0.750	10.000	
1200	0.750	12.000	

All dimensions given in inches.

[1] See illustrations above Tables 2, 3, 4 and 5.

[2] These sizes are continued in the Tang Drive series for the present to meet special needs.

TABLE 8 — Dimensions of Steep Machine Tapers

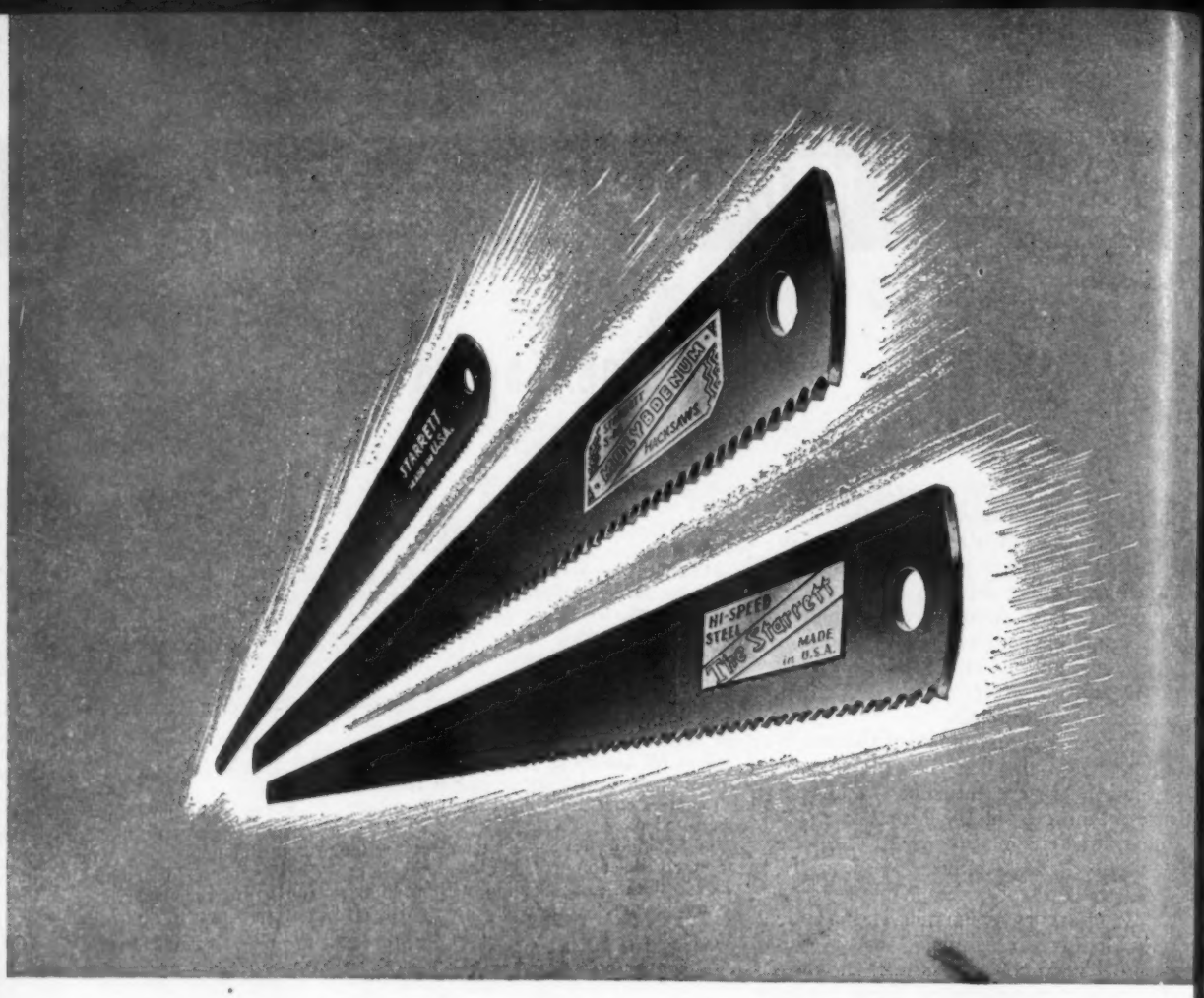
No. of Taper	Taper per Foot[1]	Diameter at Gage Line		Length Along Axis	
5	3.500	1/2	0.500	11/16	0.6875
10	**3.500**	**5/8**	**0.625**	**7/8**	**0.8750**
15	3.500	3/4	0.750	1 1/16	1.0625
20	**3.500**	**7/8**	**0.875**	**1 5/16**	**1.3125**
25	3.500	1	1.000	1 9/16	1.5625
30	**3.500**	**1 1/4**	**1.250**	**1 7/8**	**1.8750**
35	3.500	1 1/2	1.500	2 1/4	2.2500
40	**3.500**	**1 3/4**	**1.750**	**2 11/16**	**2.6875**
45	3.500	2 1/4	2.250	3 5/16	3.3125
50	**3.500**	**2 3/4**	**2.750**	**4**	**4.0000**
55	3.500	3 1/2	3.500	5 3/16	5.1875
60	**3.500**	**4 1/4**	**4.500**	**6 3/8**	**6.3750**

All dimensions given in inches.

[1] This taper corresponds to an included angle of 16°, 35′, 33.4″.

The tapers numbered 10, 20, 30, 40, 50, and 60 that are printed in heavy-faced type are designated as the "Preferred Series." The tapers numbered 5, 15, 25, 35, 45, and 55 that are printed in light-faced type are designated as the "Intermediate Series."

STARRETT HACKSAWS



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Machine Tapers—II

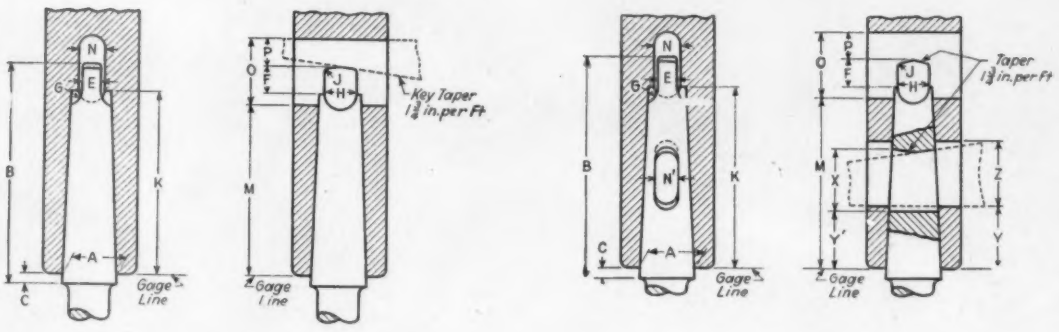


TABLE 2 — Tang Drive With Shank Retained by Friction

	Diameter at Gage Line[1]	Shank		Tang					Socket		Knockout Keyway		
		Overall Length	Exposed Length	Thickness	Length	Radius of Mill	Diameter	Radius	Depth	Gage Line to Keyway	Width	Length	Shank End to Back of Keyway
	A	B	C	E	F	G	H	J	K	M	N	O	P
.239	0.23922	1 9/32	3/32	0.125	3/16	3/16	11/64	1/32	1 1/16	15/16	0.141	3/8	1/8
.299	0.29968	1 19/32	3/32	0.1562	1/4	3/16	7/32	1/32	1 5/16	1 11/64	0.172	1/2	11/64
.375	0.37525	1 31/32	3/32	0.1875	5/16	3/16	9/32	3/64	1 5/8	1 15/32	0.203	5/8	7/32
1	0.47500	2 9/16	1/8	0.2031	3/8	3/16	11/32	3/64	2 3/16	2 1/16	0.213	3/4	3/8
2	0.70000	3 1/8	3/16	0.250	7/16	1/4	17/32	1/16	2 21/32	2 1/2	0.260	7/8	7/16
3	0.93800	3 7/8	3/16	0.3125	9/16	9/32	23/32	5/64	3 5/16	3 1/16	0.322	1 5/16	9/16
4	1.23100	4 7/8	1/4	0.4687	5/8	5/16	31/32	3/32	4 3/16	3 7/8	0.478	1 1/4	1/2
4 1/2	1.50000	5 3/8	1/4	0.5625	11/16	3/8	1 13/64	1/8	4 5/8	4 5/16	0.573	1 5/8	9/16
5	1.74800	6 1/8	1/4	0.625	3/4	3/8	1 13/32	1/8	5 5/16	4 15/16	0.635	1 1/2	9/16
6[2]	2.49400	8 9/16	5/16	0.750	1 1/8	1/2	2	5/32	7 13/32	7	0.760	1 3/4	1/2
7[2]	3.27000	11 5/8	5/8	1.125	1 3/8	3/4	2 5/8	3/16	10 5/32	9 1/2	1.135	2 5/8	7/8

All dimensions given in inches.

[1] See table 6 for plug dimensions.

[2] These sizes are continued in the Tang Drive series for the present to meet special needs.

TABLE 3 — Tang Drive With Shank Retained by Key

No. of Taper	Diameter at Gage Line[1]	Shank		Tang					Holdback Keyway—Shank[3]			Socket		Knockout Keyway[3]			Holdback Keyway—Socket[3]		
		Overall Length	Exposed Length	Thickness	Length	Radius of Mill	Diameter	Radius	Gage Line to Bottom of Keyway	Length	Width	Depth	Gage Line to Keyway	Width	Length	Shank End to Back of Keyway	Gage Line to Front of Keyway	Length	Width
	A	B	C	E	F	G	H	J	Y'	X	N'	K	M	N	O	P	Y	Z	N'
3	0.93800	3 7/8	3/16	5/16	9/16	9/32	23/32	5/64	1 1/32	1 1/8	0.260	3 1/4	3 1/16	0.322	1 3/16	9/16	1 1/8	1 3/16	0.260
4	1.23100	4 7/8	1/4	15/32	5/8	5/16	31/32	3/32	1 13/32	1 3/16	0.385	4 1/4	3 7/8	0.478	1 1/4	1/2	1 1/2	1 1/4	0.385
4 1/2	1.50000	5 3/8	1/4	9/16	11/16	3/8	1 13/64	1/8	1 23/32	1 1/4	0.447	4 9/16	4 5/16	0.573	1 5/8	9/16	1 13/16	1 3/8	0.447
5	1.74800	6 1/8	1/4	5/8	3/4	3/8	1 13/32	1/8	2	1 3/8	0.510	5 1/4	4 15/16	0.635	1 1/2	9/16	2 1/16	1 1/2	0.510
6[2]	2.49100	8 9/16	5/16	7/8	1 1/8	1/2	2	5/32	2 3/8	1 5/8	0.635	7 5/8	7	0.760	1 3/4	1/2	2 1/4	1 5/8	0.635
7[2]	3.27000	11 5/8	5/8	1 1/8	1 5/8	3/4	2 5/8	3/16	2 1/2	1 11/16	0.760	10 1/8	9 1/2	1.135	2 5/8	7/8	2 5/8	1 13/16	0.760

All dimensions given in inches.

[1] See Table 6 for plug gage dimensions.

[2] These sizes are continued in the Tang Drive series for the present to meet special needs.

[3] Corners at entrance side of Keyways shall be chamfered at 45 deg. as follows: No. 3, 3/64 in. and all other sizes 1/16 in. deep.

TOLERANCES

For Diameter of Shank at Gage Line (A)
All sizes, + 0.002 — 0.000

For Diameter of Hole at Gage Line (A)
All sizes, + 0.000 — 0.002

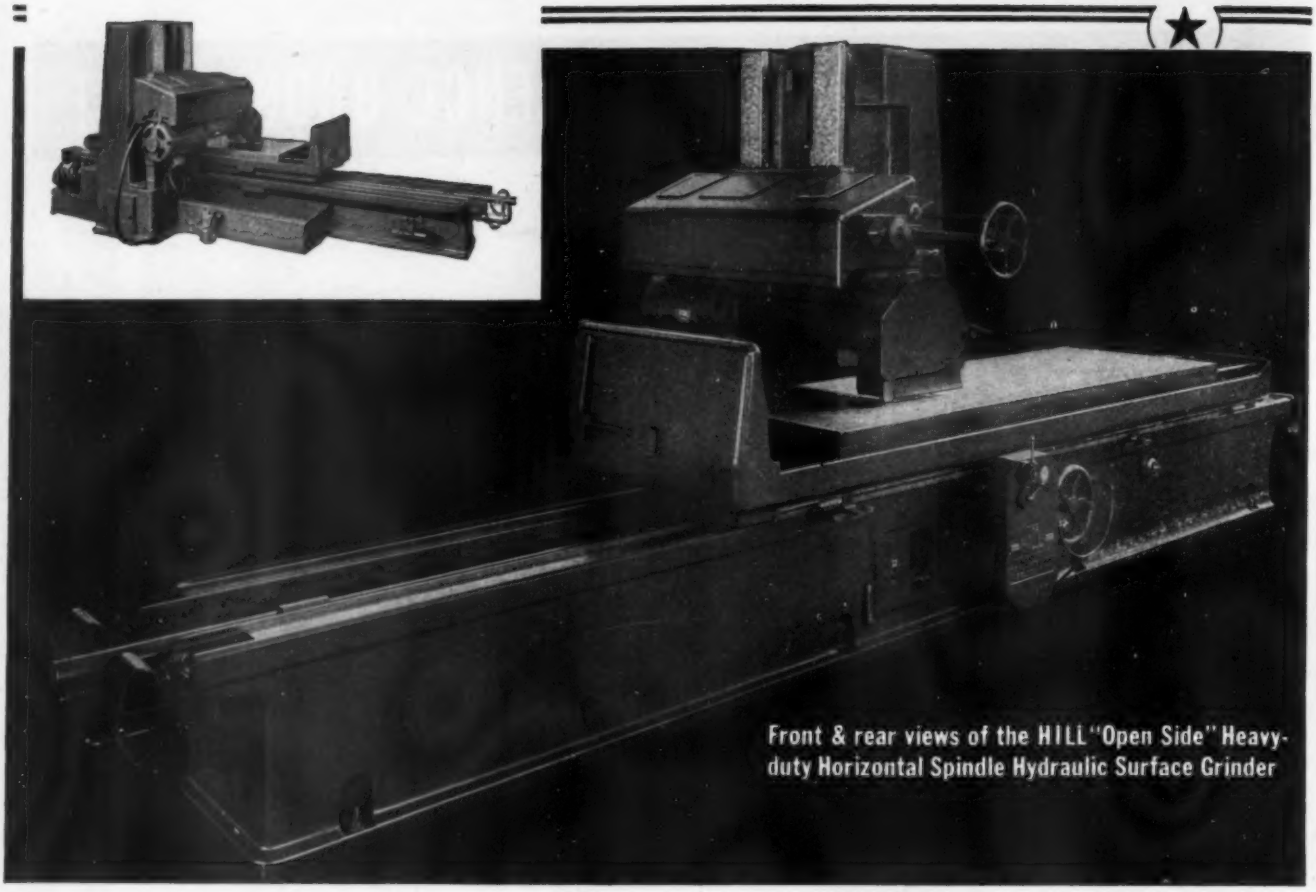
For Thickness of Tang (E)
Up to and including No. 5, + 0.000 — 0.006
Larger than No. 5, + 0.000 — 0.008

For Width of Knockout Keyway (N)
Up to and including No. 5, + 0.006 — 0.000
Larger than No. 5, + 0.008 — 0.000

For Concentricity of Tang (E) with center line of taper
Up to and including No. 5, 0.0035 (Indicator reading)
Larger than No. 5, 0.005 (Indicator reading)

For Concentricity Knockout Keyway (N) with center line of taper
Up to and including No. 5, 0.0035 (Indicator reading)
Larger than No. 5, 0.005 (Indicator reading)

Tolerances on Fractional Dimensions, ± 0.010 unless otherwise specified.



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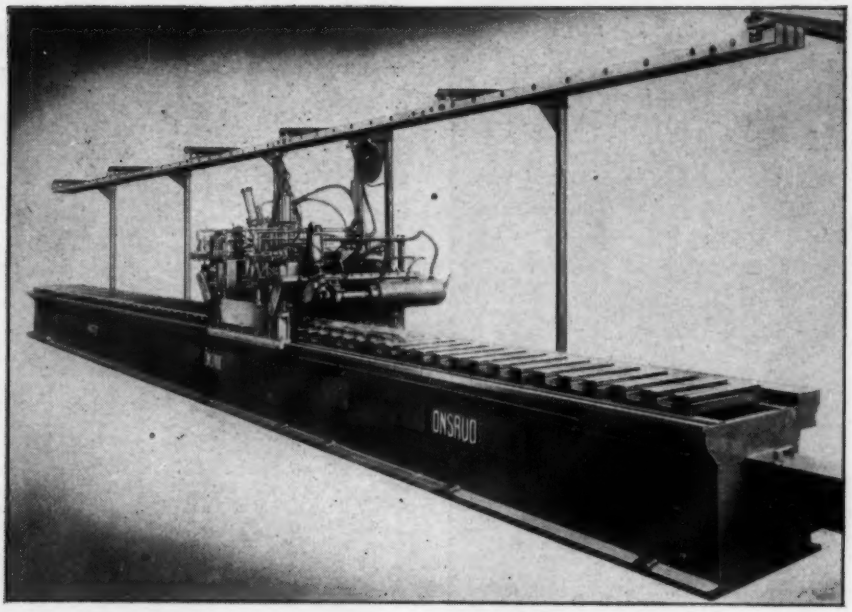
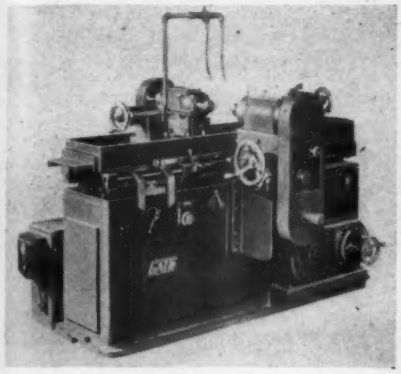
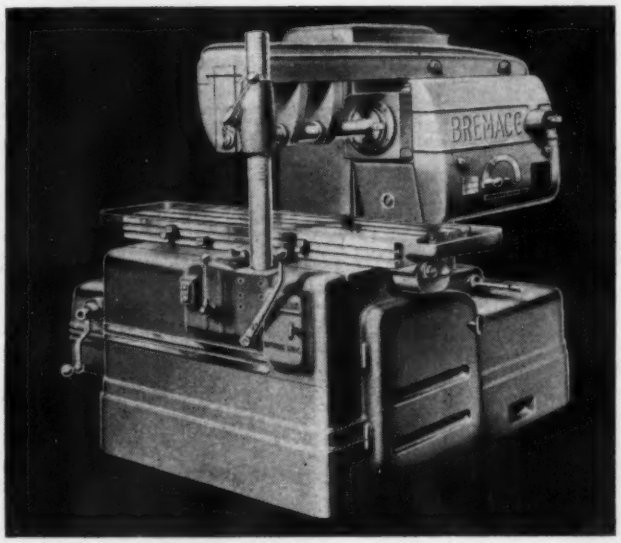
CONTOUR MILLER — *Onsrud Machine Wks., Inc., 3910 Palmer St., Chicago, Ill.* The A80-A automatic contour milling machine is built to handle long aircraft spar beams and similar parts. Over-all width is 7 ft., 8 in., including trolley and duct posts. Length can be any combination of 7½- and 15-ft. sections. Carriage travel is from 4 in. to 18 ft., 6 in. per min., controlled manually or automatically. Two vertical and two horizontal cutters make possible four operations in one pass. Mar. 4, 1943, p. 121. →

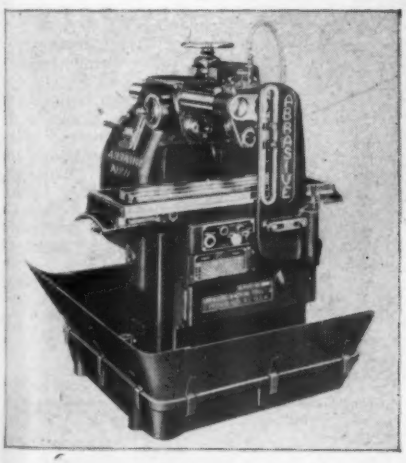




KEYWAY MILLER—*Giern & Anholtt Tool Co., 1308-12 Mt. Elliott Ave., Detroit, Mich.* This duplex spline and keyway miller is for use on extremely long pieces at one setting. Two milling heads located at 180 deg. from each other feed toward one another at rates up to 0.020 in. per stroke. Its capacity is 10 in. diameter and 50 in. between centers. Apr. 15, 1943, p. 129.



MILLING MACHINE—*Bremacc Corp., 2030 E. Grand Blvd., Detroit, Mich.* The No. 4 is designed for down-cut milling; has 48-in. maximum table travel. Spindle nose is standard No. 50 and spindle speeds range from 25 to 1,250 r.p.m. Maximum distance spindle to table is 20 in.; cross travel, 10 in. May 27, 1943, p. 133.



MILLING MACHINE—*Abrasive Machine Tool Co., E. Providence, R. I.* The B-11 miller is designed for medium size work in long or short runs. It has complete electrical control for table and spindle power movements. Nov. 11, 1943, p. 126.

SEMI-AUTOMATIC MILLER—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* Connecting rods can be weighed and balance-milled on this special purpose machine. Stock to be removed is accurately indicated by lights. Not shown. July 8, 1943, p. 133.

MILLING MACHINE — *Modern Tool Wks., Ltd., 69 Montcalm Ave., Toronto, Canada.* The Hydraulpro machine is made in sizes 14-36 and 14-60. Work table width is 14 in., and longitudinal feed 36 and 60 in. respectively. Control is provided to interlock spindle rotation with hydraulic table movements. Sept. 30, 1943, p. 114.

PROFILE MILLER—*E. A. Thompson Mfg. Co., 1300 Hilton Rd., Ferndale, Mich.* Irregularly shaped parts can be produced on this automatic miller which has a 14-in. rotating table. The spindle nose has a standard No. 40 taper, and spindle speeds range from 127 to 3,435 r.p.m. July 22, 1943, p. 130.

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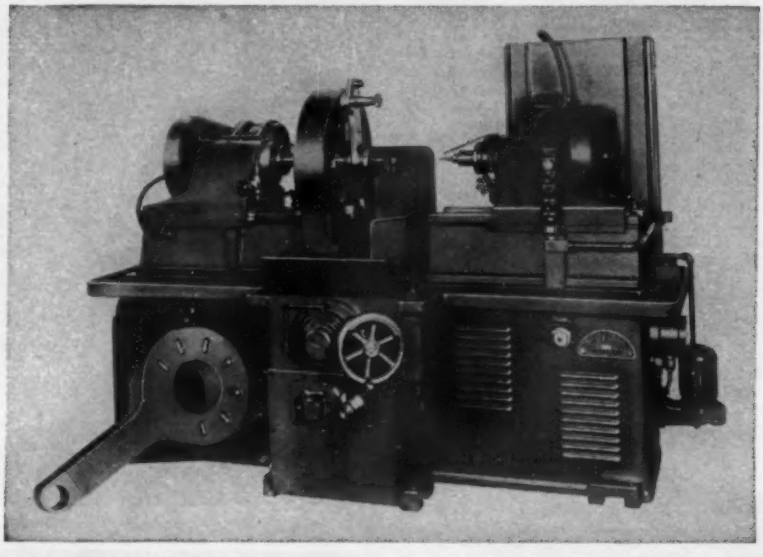
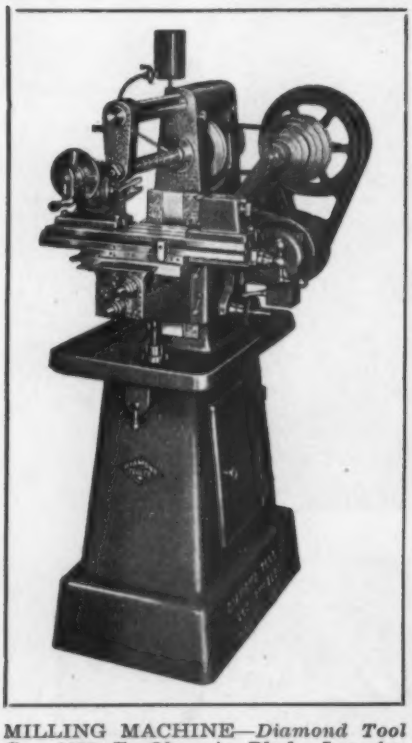
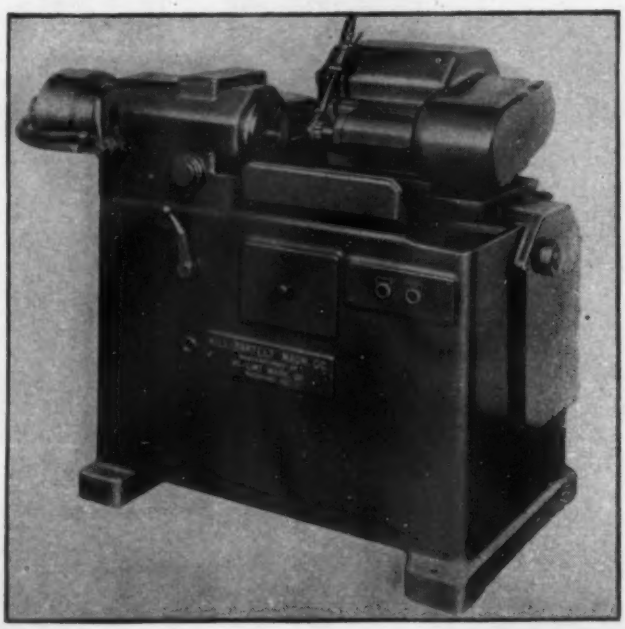


SPLINE MILLING MACHINE—*Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit, Mich.* Two slots can be cut at one time on aircraft master rods with this double-end spline miller. Nov. 25, 1943, p. 128.



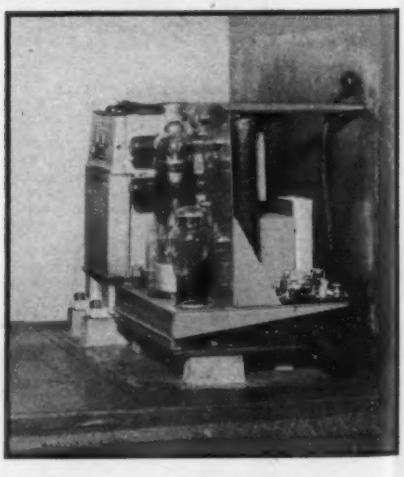
MILLING MACHINE—*Diamond Tool Co., 3429 E. Olympic Blvd., Los Angeles, Calif.* This machine is offered in both toolroom and production models. Production models have rack and pinion feed. Feb. 18, 1943, p. 144.

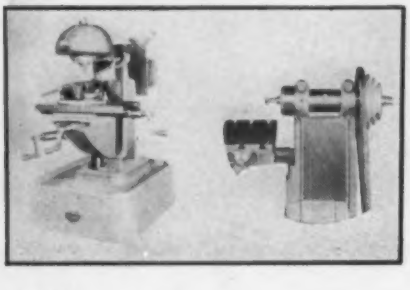


THREAD MILLER — *Hill-Bartelt Machine Co., 229 S. Church St., Rockford, Ill.* This company has developed a single purpose and a general purpose thread milling machine. The single purpose machine uses multiple-type thread mills and the general purpose uses those or single cutters. The latter has tilting adjustment on the cutter head. Feb. 4, 1943, p. 116.

→

VERTICAL MILLER—*Reed-Prentice Corp., Worcester, Mass.* An electronic control for the selection of variable feed rate on the power down feed has been added to the No. 4 vertical miller and die sinker to provide infinitely variable range of feeds and instantaneous selection of feed rate. Its use eliminates a gear box. Oct. 14, 1943, p. 152.





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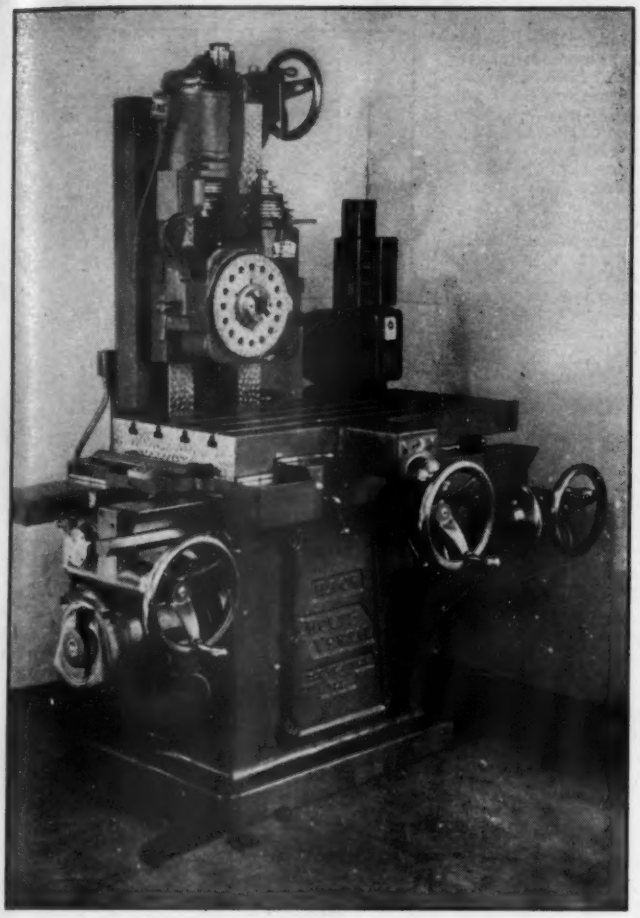
VERTICAL BENCH MILLER—*Benchmaster Tool Co., 2952 W. Pico, Los Angeles, Calif.* This machine has a quick-change attachment for horizontal milling. It is 30 in. high with a 6x15 in. table. Four spindle speeds are available, with rapid speed change. Aug. 19, 1943. p. 131.



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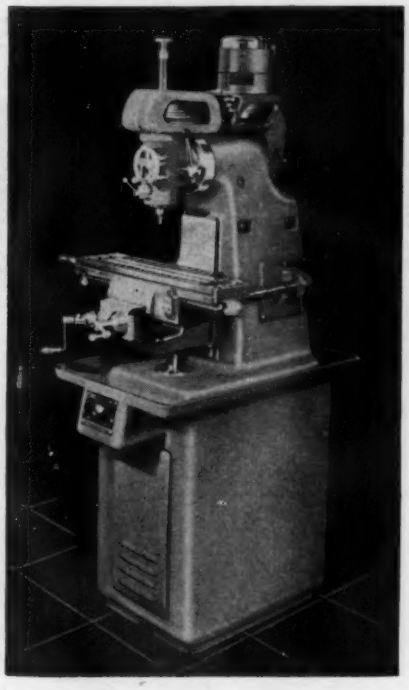
UNIVERSAL MILLER — *Hack Machine Co., 1226 Harding Ave., Chicago, Ill.* Complicated shapes and angles can be handled on this machine which has a high speed range suitable for jig boring as well as a low speed range. Reciprocating and rotary cutting may be used. Cutters which can be used range from ¼-in. end mills to 8-in. face mills. Aug. 19, 1943, p. 132.



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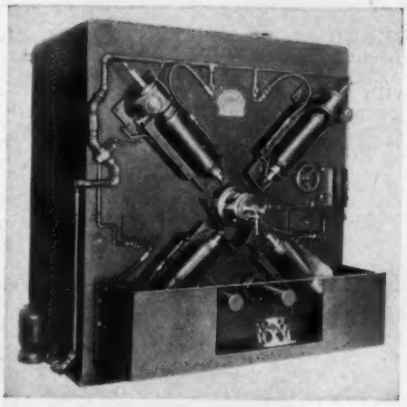
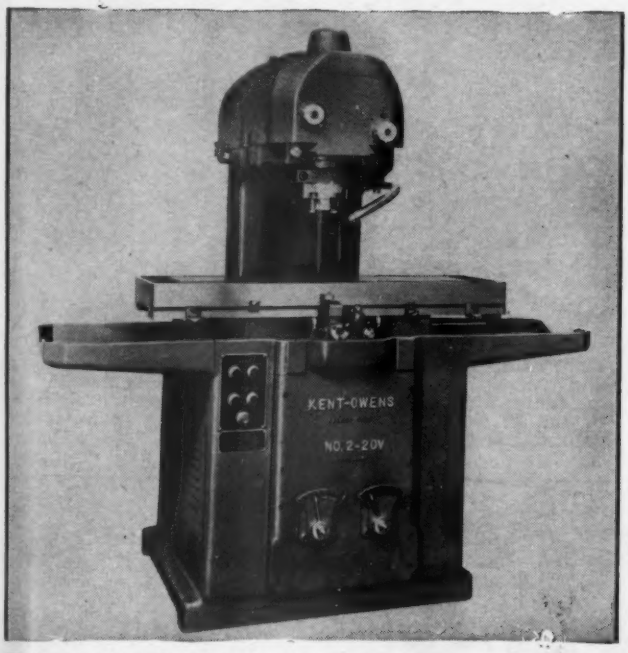
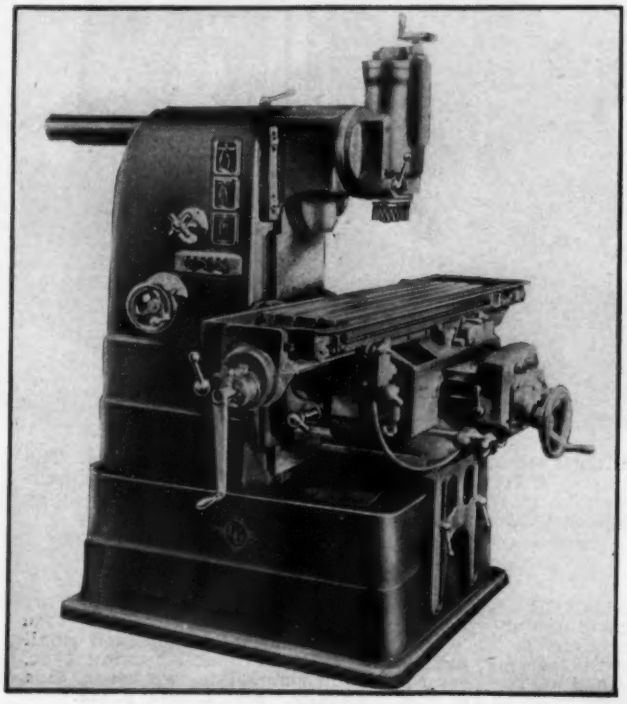
VERTICAL MILLER — *Industrial Tool & Die Wks., Minneapolis, Minn.* The No. 0-9 is a combination vertical miller and jig borer with six spindle speeds from 300 to 3,000 r.p.m. The table has 12 in. longitudinal travel and 6 in. cross-travel. Spindle takes No. 7 B. & S. taper. Apr. 29, 1943, p. 117.



→
CAM MILLER — *Snyder Tool & Engineering Co., 3400 E. Lafayette, Detroit 7, Mich.* Four cam slots in aircraft propeller cams can be finish milled at one time on this special hydraulic machine. Dec. 9, 1943, p. 124.



VERTICAL MILLER—*Kent-Owens Machine Co., Toledo, Ohio.* The Model 2-20V permits independent adjustment of the feed rate for opposite directions of table travel. Thus, two operations can be performed at a time. The 42x12 in. table has a 20-in. travel. Standard speeds range from 64 to 860 r.p.m., but either higher or lower ranges are available. Sept. 16, 1943, p. 128.



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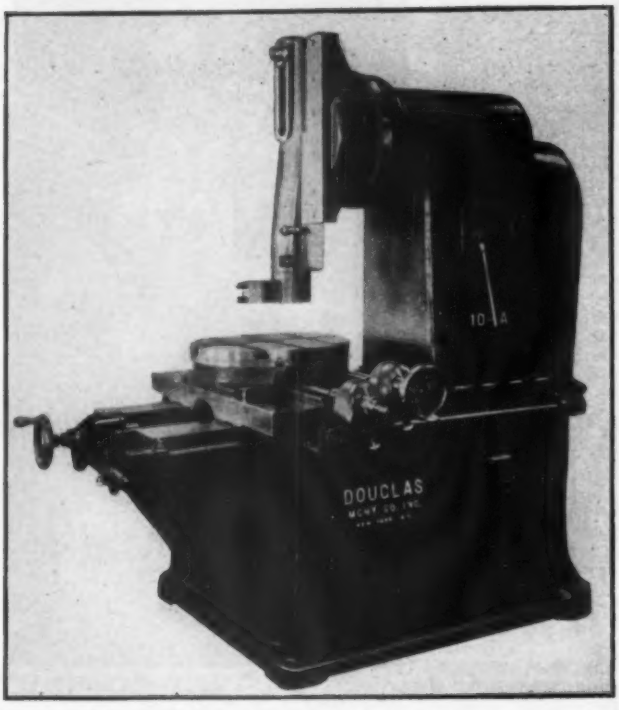
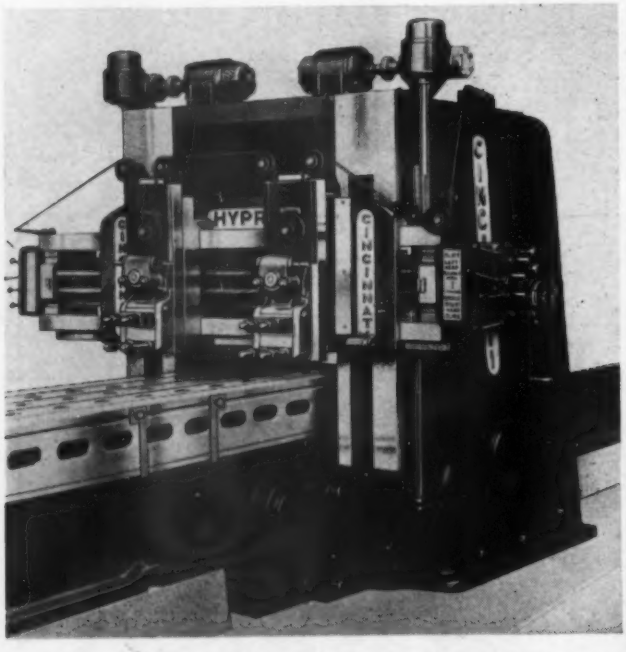
UNIVERSAL MILLER—*Lombard Governor Co., Ashland, Mass.* This 30 HV machine handles either horizontal or vertical work. Horizontal feed is 28 in., cross feed 10 in. and vertical feed 4 in. It has six direction power rapid traverse. Feb. 4, 1943, p. 122.

MACHINE TOOLS — Planers and Shapers



VERTICAL SLOTTER — *Douglas Machinery Co., 150 Broadway, New York, N. Y.* This machine has a swiveling ram head and tool holder; available in three sizes with strokes of 7½, 8½ and 10 in. respectively. Convex, concave and irregularly shaped work can be macnined without special fixtures. The automatic circular table has 20 in. cross and longitudinal travel. Feb. 4, 1943, p. 122.



PLANER—*Cincinnati Planer Co., Cincinnati, Ohio.* The improved Hypro planer has been designed for maximum rigidity in withstanding heaviest cuts on railroad frogs and switches. Sept. 16, 1943, p. 130.

PLANER—*Liberty Planers, Inc., Hamilton, Ohio.* This medium-duty planer with double length bed of three sections is for work which cannot be handled on small standard-duty machines. It is of double-housing type, 48x48 in. The crossrail will accommodate two heads. Side heads can be operated manually. Apr. 1, 1943, p. 113.

SHAPER — *Sales Service Machine Co., 2426 University Ave., St. Paul 4, Minn.* A fine finish at high speed can be produced on this 8-in. stroke Hy-Duty Dape-Rite machine, which is furnished with either a plain or swivel table. Ram operation up to 160 strokes per min. is provided. Oct. 28, 1943, p. 128.

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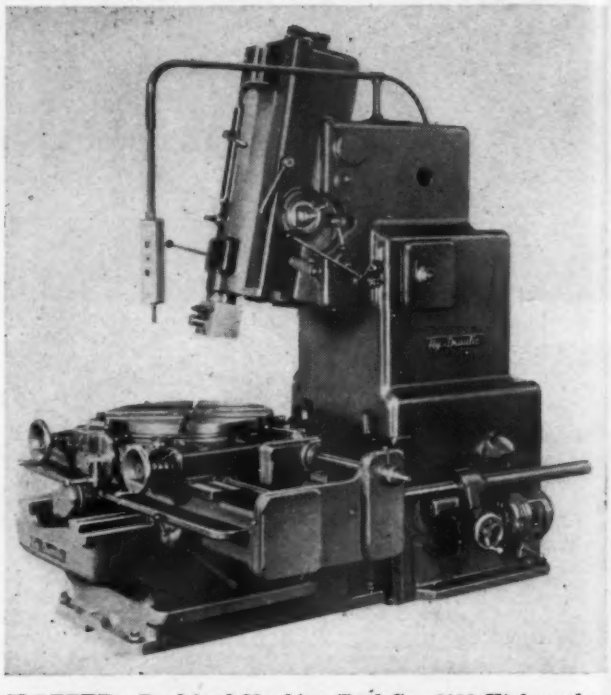
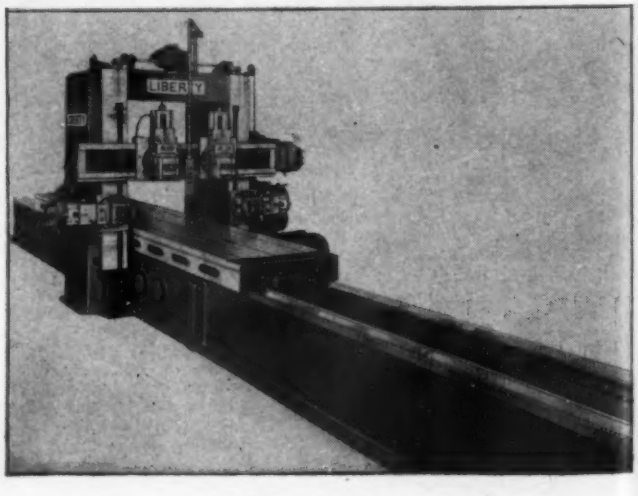
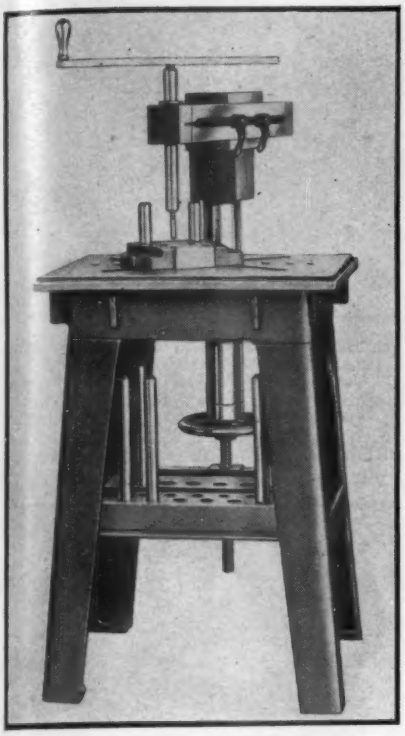
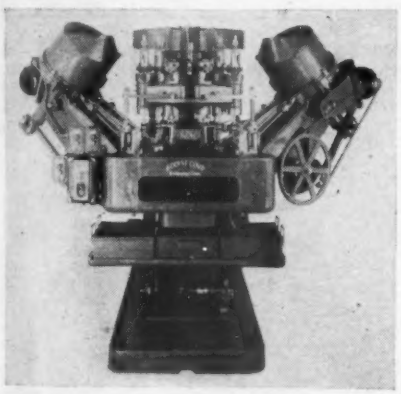


SLOTTER—*Rockford Machine Tool Co., 2498 Kishwaukee St., Rockford, Ill.* The 12-in. Hy-Draulic will machine to the center of a 48-in. circle. Cutting speeds range between 10 and 75 ft. per min. The 28-in. table has 26 in. longitudinal and transverse movement. Sept. 30, 1943, p. 113.





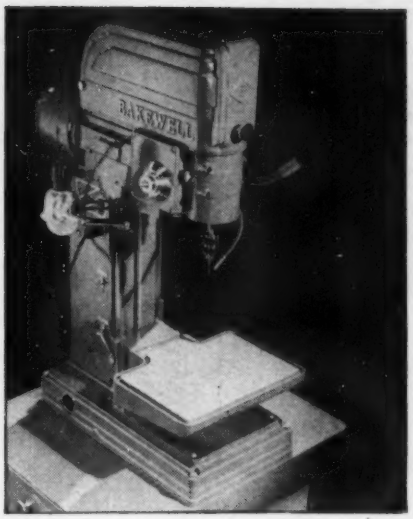
HAND TAPPER—*Producto Machine Co., Bridgeport, Conn.* Holes can be tapped or reamed at any point on the work within table area of this universal machine which has a pivoting arm that can be locked in any position. The table measures 28x18 in. and is drilled to locate work without clamping. Taps from No. 5 to 1 in. diameter may be used. Sept. 16, 1943, p. 136.



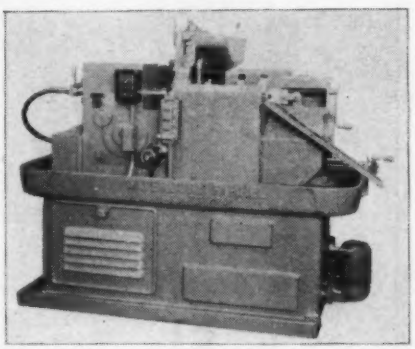
NUT TAPPER—*Bodine Corp., 317 Mountain Grove St., Bridgeport, Conn.* The machine is available in two sizes, one for handling nuts up to and including ¼-in.-28, and the other for ½-in.-20. The machine delivers four nuts at once to four tapping stations by means of two hoppers. Sept. 30, 1943, p. 124.

→

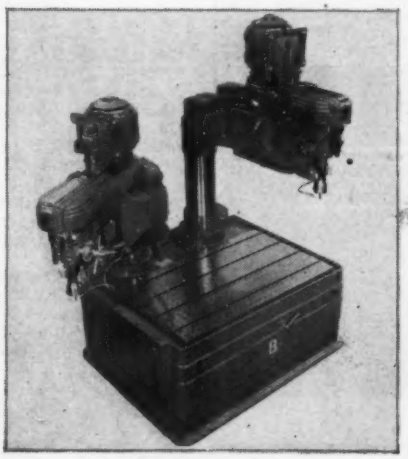
TAPPING AND THREADING MACHINE—*Bakewell Mfg. Co., 2427 E. 14th St., Los Angeles, Calif.* Internal or external threads, right- or left-hand can be cut with this machine, available with one or two complete tapping heads. The double-headed radial may be used for tapping two sizes of holes, working on two pieces, or one head may be equipped with a drill. Mar. 4, 1943, p. 122.

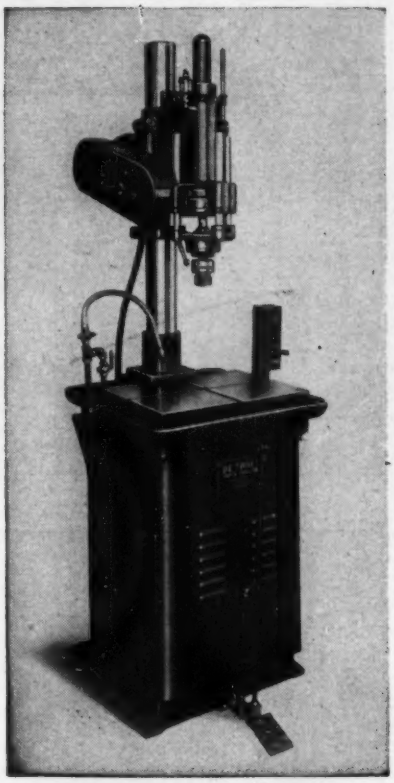


TAPPING MACHINE—*Bakewell Manufacturing Co., 2023 Santa Fe Ave., Los Angeles, Calif.* Tapping and external threading of Class 2, 3, 4 and 5 gage fits is done on this machine in one pass of the tap. The spindle has a 2-in. stroke and a maximum tapping depth of 1¼ in. It is made for bench mounting. Apr. 29, 1943, p. 120.

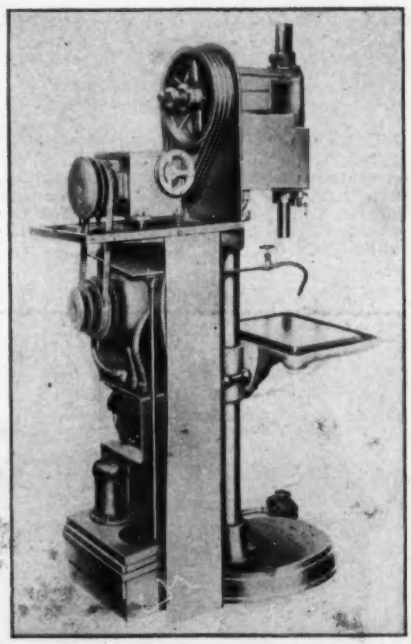


TAPPING MACHINE — *Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.* A selector mechanism is provided to handle special work such as slotted and castellated nuts in this machine. It is available in three standard sizes with a range from ¼ to ⅞ in. tap diameter capacity. Mar. 18, 1943, p. 126.

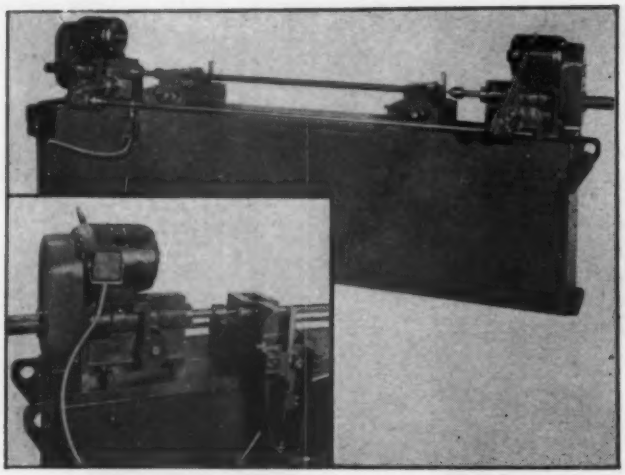




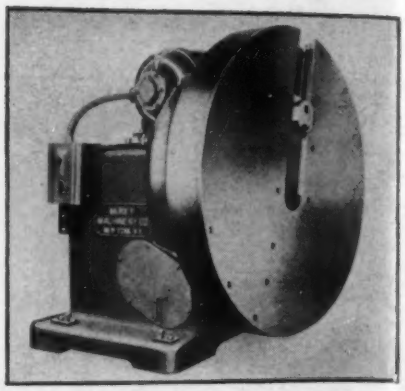
TAPPING MACHINE—*Detroit Tap & Tool Co., 8432 Butler Ave., Detroit 11, Mich.* A light-duty leadscrew type series of tapping machines is available with a maximum capacity of ⅞ in. diameter, and 14 pitch in mild steel. Dec. 23, 1943, p. 132.



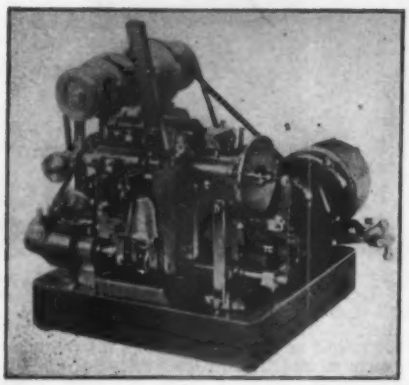
TAPPING MACHINE—*Cleveland Tapping Machine Co., 1725 Superior Ave., Cleveland, Ohio.* Speed ranges of this heavy-duty Model DB leadscrew machine are from 45 to 300 r.p.m. Its capacity is 1¼ in. National Coarse thread in steel. Mar. 4, 1943, p. 121.



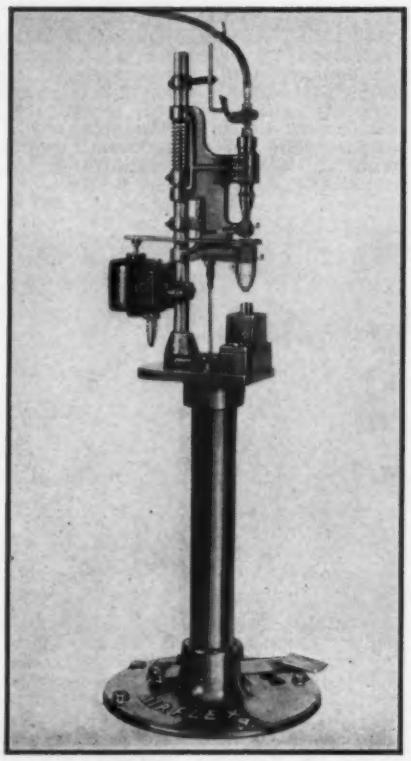
CENTERING MACHINE — *Pines Engineering Co., Aurora, Ill.* This two-spindle machine takes bars up to 6 ft. long and up to 5 in. diameter. One head and chuck is stationary and the other is movable to accommodate the work. Jan. 7, 1943, p. 114.



FACING MACHINE—*Morey Machine Co., 410 Broome St., New York, N. Y.* Two-way feed is provided in this stationary machine which has capacity up to 46 in. diameter. A tool similar to that used in a lathe is used and fed either way—from or toward the center. June 10, 1943, p. 138.

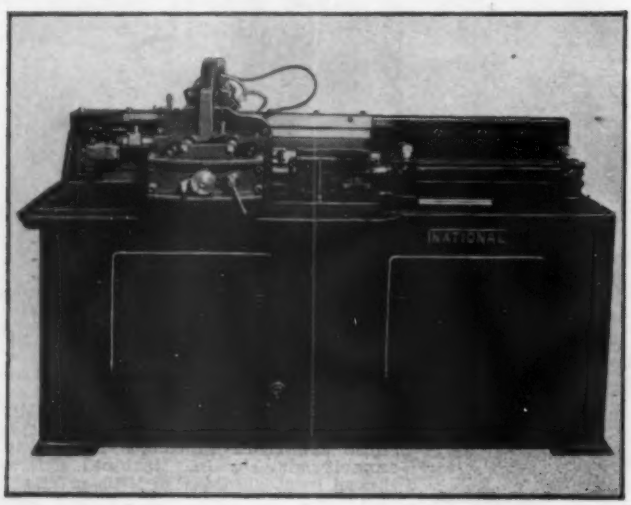


PINION CUTTER—*Waltham Machine Wks., Waltham, Mass.* Strokes of 3/16 to 1 3/16 in. can be taken with this machine, which now has a motor-drive unit to give variable stroke lengths. Hand or magazine feeding can be employed. Feb. 1, 1943, p. 113.

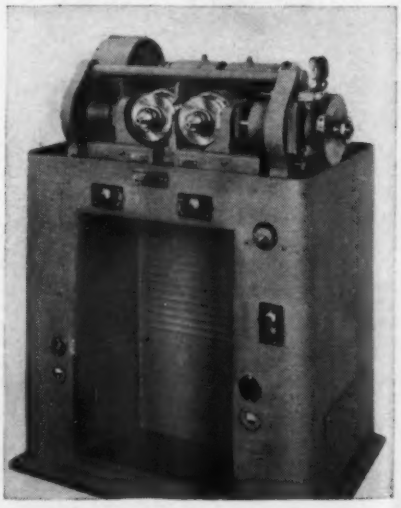


RIVETER—*Airflex Equipment Co., 13255 Birwood, Detroit, Mich.* This equipment is suited for making round, oval and flat head rivets, for peening shafts, pins and studs. Models for capacities from 5/32 to 5/16 in. are available. Nov. 11, 1943, p. 136.

METAL STITCHER—*Harris-Seybold-Potter Co., Seybold Div., Dayton, Ohio.* Any combination of materials such as aluminum alloys, stainless steel, can be handled in thickness up to ¾ in. July 8, 1943, p. 146.

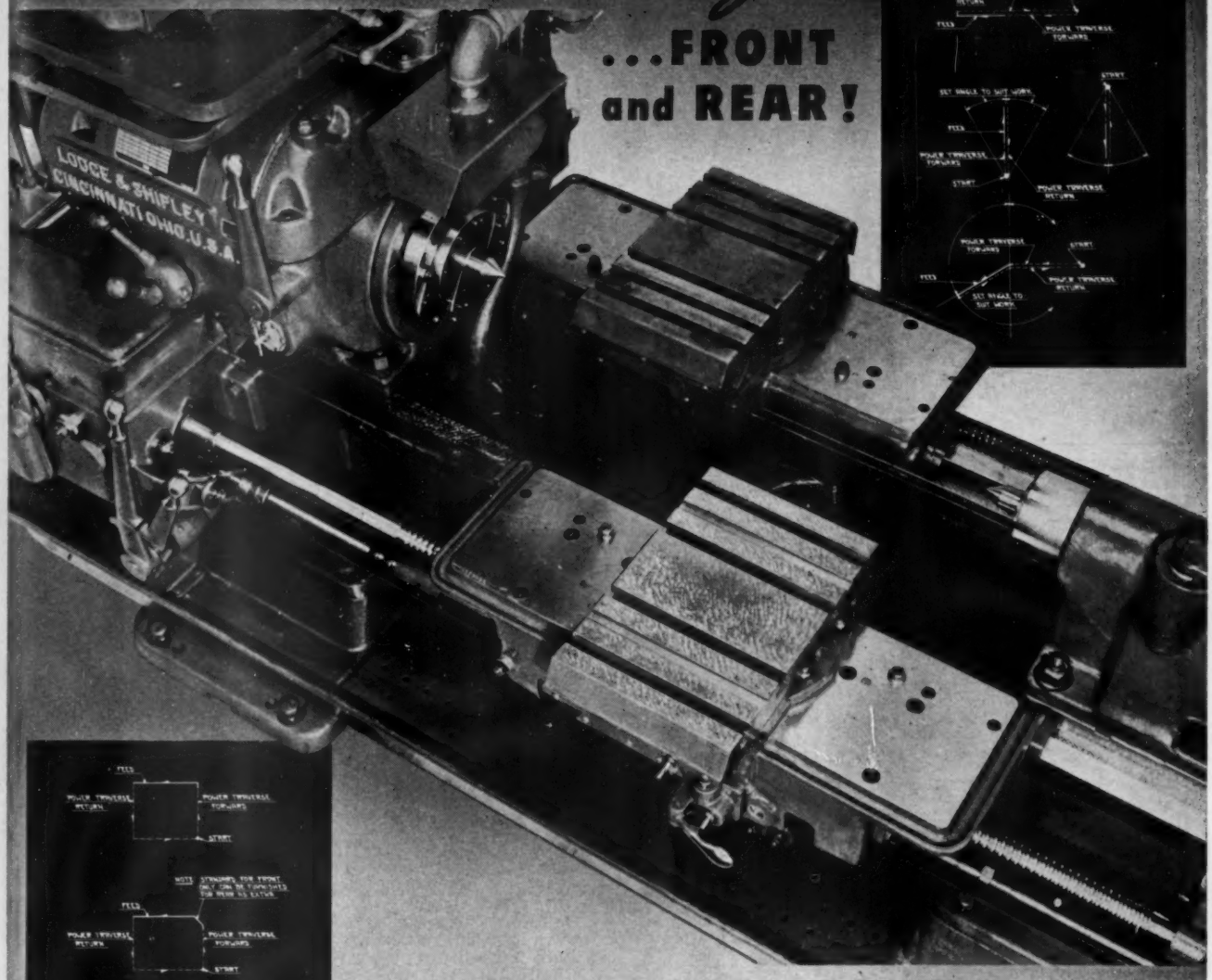


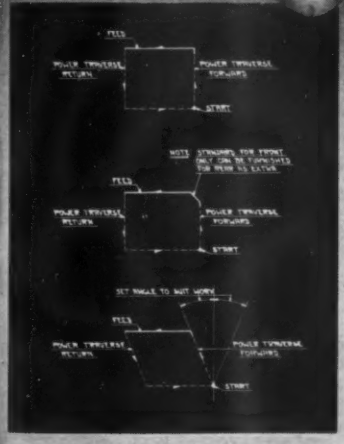
THREAD ROLLING MACHINE — *National Electric Welding Machines Co., 1346 N. Trumbull St., Bay City, Mich.* Class 3 and 4 threads can be rolled on alloy steel bolts with this fully hydraulic machine. A hopper feed can be applied for automatically feeding bolt blanks. July 8, 1943, p. 134.



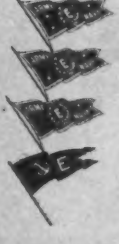
THREAD ROLLING MACHINE — *Watson-Flagg Machine Co., Paterson, N. J.* Distributed by *W. A. Schuyler, 250 W. 57th St., New York 19, N. Y.* External threads up to 2¾ in. long and from 3/16 to 2½ in. diameter can be rolled on this machine by the cold forming process. Sept. 2, 1943, p. 126.

Standard Cycles ...FRONT and REAR!





Oct. 8, 1943
Feb. 23, 1943
Aug. 23, 1942
March 6, 1942



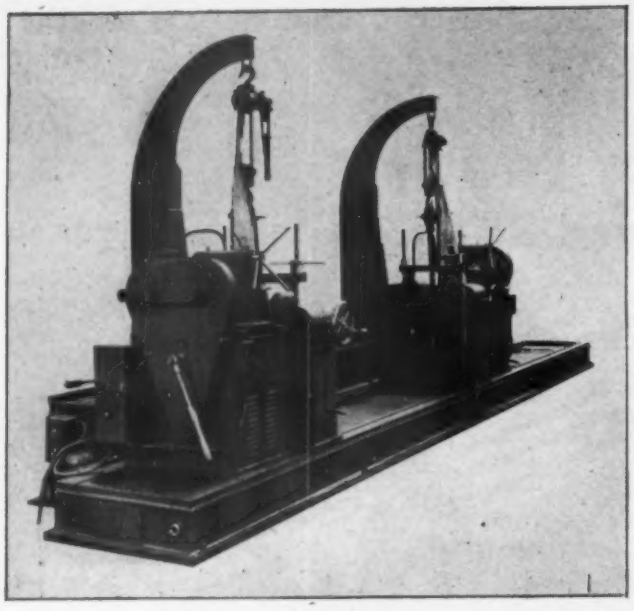
THE No. 3-A DUOMATIC LATHE is a full automatic lathe for the advantageous use of multiple tools in turning and straight and angular facing operations. It is particularly adapted to quantity production of lathe work in small or large lots whether between centers on an arbor or in suitable chucks or fixtures.

Write for Descriptive Booklet, No. 601-FL.

THE LODGE & SHIPLEY MACHINE TOOL CO.

CINCINNATI, OHIO, U.S.A.

ENGINE TOOL ROOM AUTOMATIC OIL COUNTRY LATHES

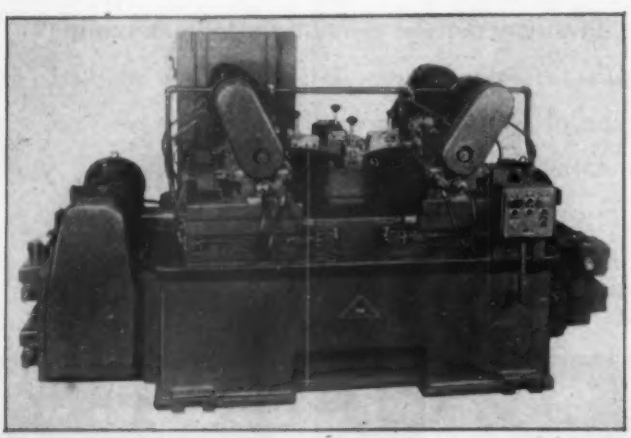


CENTERING MACHINE — *Kent-Owens Machine Co., Toledo, Ohio.* Work up to 14 in. diameter and 19 ft. long can be accommodated in this double-end machine. Work is suspended in slings and adjusted into position by davits. Two spindles are on each head, one for a starting tool and the other for finishing. Feb. 18, 1943, p. 137.

CENTERING MACHINE—*Whitcomb Mfg. Co., 476 Eighth St., Troy, N. Y.* Round bars from ½ to 3 in. diameter can be centered on this machine by means of self-centering jaws operated by a handwheel. Aug. 5, 1943, p. 132.

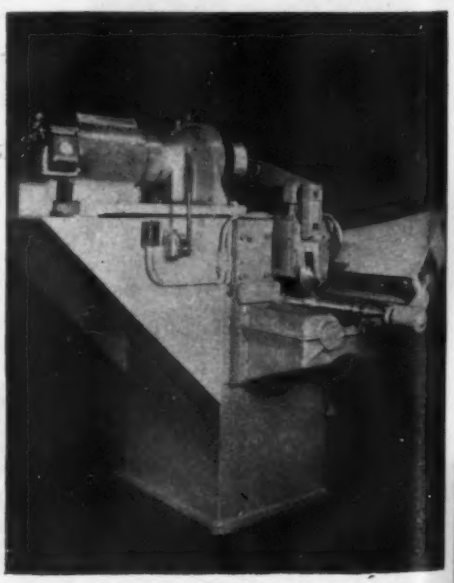
FLANGING MACHINE — *Riverside Machinery Co., 10632 S. Michigan Ave., Chicago, Ill.* The Multi-Flanger produces flanged edges on strips or discs in gages up to 14. Length of the forming operation is unlimited. Operators may use both hands to manipulate the material being flanged. Sept. 16, 1943, p. 140.

RIVETER—*General Engineering Co., 785 Hertel Ave.,* Buffalo, N. Y. Designed for riveting on a variety of work, this machine automatically heads and bucks. Two hydraulic riveting units each have capacity for heading aluminum alloy rivets in groups of six, ¼ in., nine, 3/16 in., and 15 5/32 in. diameters. The heads may be operated separately or together. July 8, 1943, p. 138.



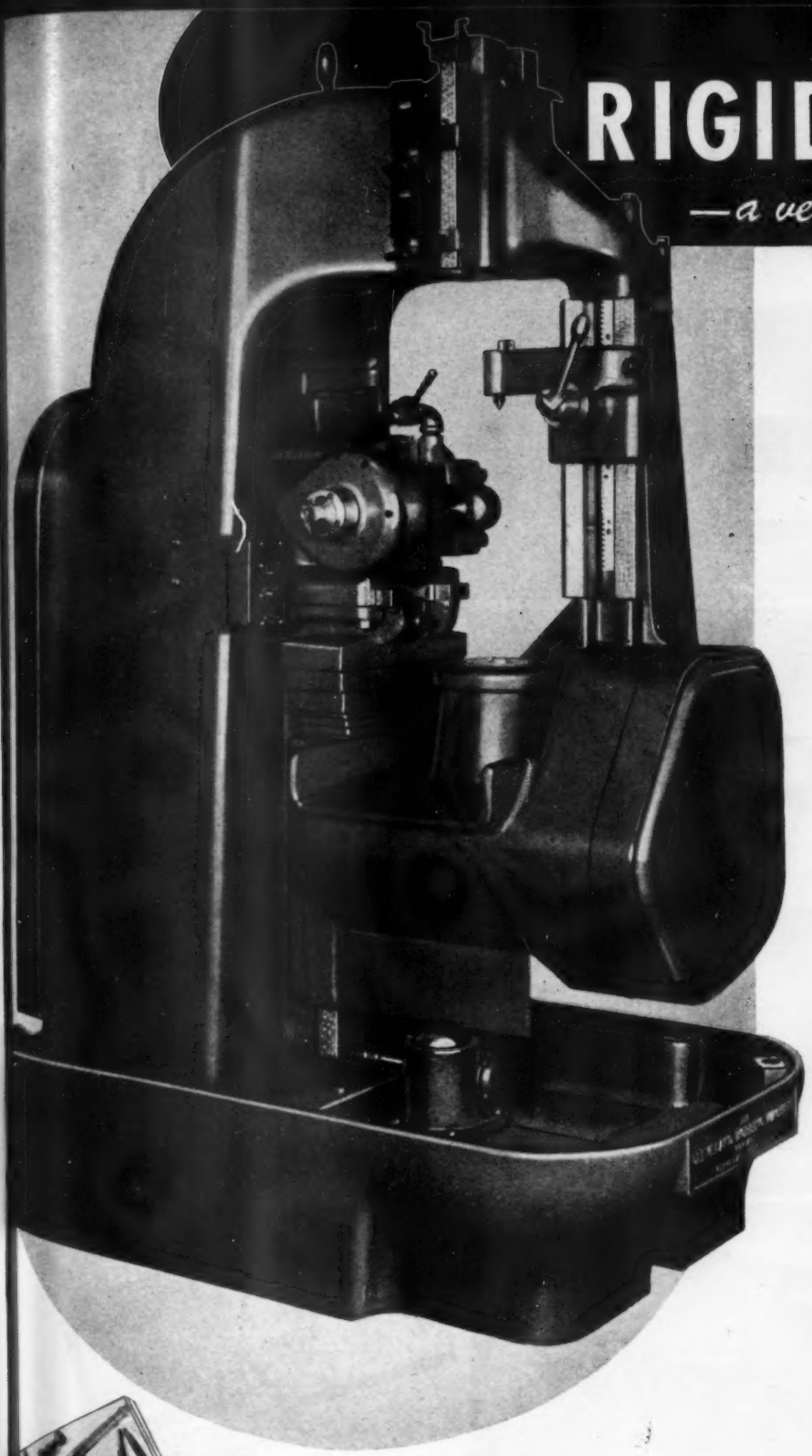
HOLLOW MILL—*LeMaire Tool & Mfg. Co., Dearborn, Mich.* This mill machines a round trunion on each end of a turbine blade and faces blade to length at the same time. Feb. 4, 1943, p. 113.

SHELL CROPPER—*Yoder Co., 5500 Walworth Ave., Cleveland, Ohio.* This equipment will trim the crop end of shell forgings shell forgings from 60 mm. trench mortar through 155 mm. high explosive shell at forging temperatures. A disk-type cutter is fed through the turning forging to crop the end. May 13, 1943, p. 134.



THE RIGIDHOBBER

—a versatile machine



for

ACCURATE HOBBING OF GEARS AND SPLINES

SEQUENCE OF OPERATION—

On the Rigidhobber the sequence of operation is usually a rapid traverse motion of the work head to the hob—feed motion through cutting portion—and rapid traverse back to loading position.

EASE OF OPERATION—

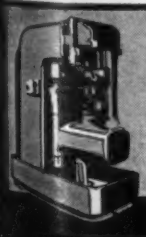
Operator merely loads and unloads work from the machine. One run button controls the machine. All other functions are performed automatically. A safety switch takes care of overload.

CLIMB HOBBING IS POSSIBLE

Not only will the hob run in either direction but the sequence of movement may be from top to bottom or from bottom to top. This is accomplished with transfer switches which makes machine readily adaptable to climb hobbing.

If you're looking for accurate hobbing of gears and splines and versatility of machine operation —put your next job on a Rigidhobber. It meets all requirements for accuracy and high production.

● *This booklet is full of useful information on Rigidhobber design, operation, and application. Write for your copy today.*



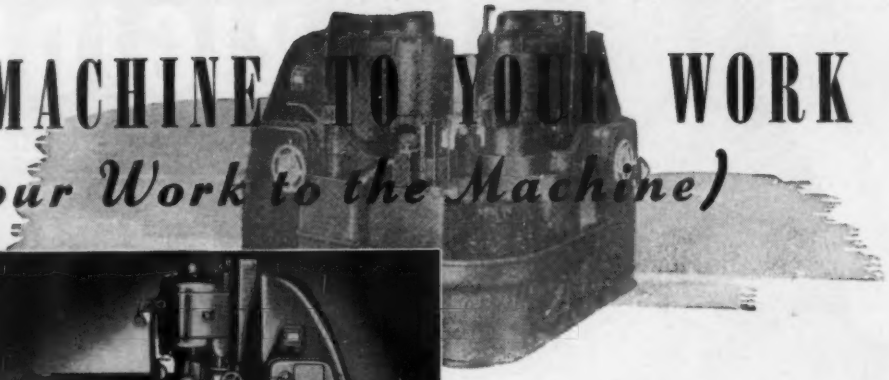
The CLEVELAND HOBBING MACHINE Company

Cleveland ... Ohio

BUILDERS OF RIGIDHOBBERS AND RIGIDTURNERS

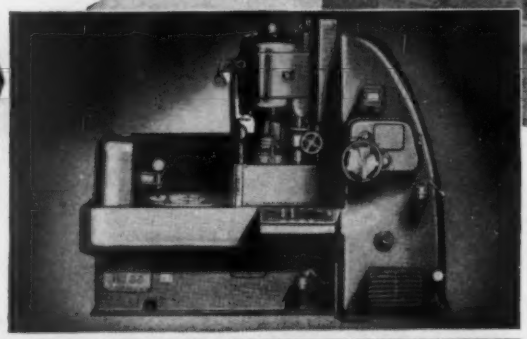
FIT THE MACHINE TO YOUR WORK

(*Not* Your Work to the Machine)



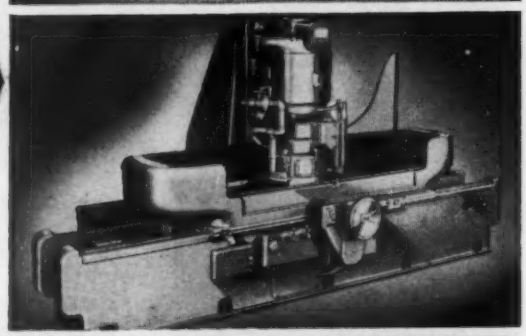
ROTARY TABLE TYPE SURFACE GRINDER

Grinds several relatively small pieces simultaneously at a high rate of production. Also efficient on single pieces.



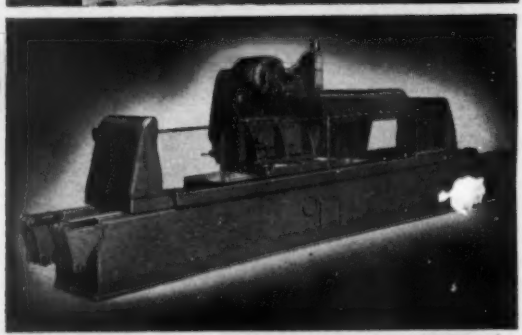
RECIPROCATING TABLE TYPE SURFACE GRINDER

Principally used for grinding long, narrow pieces singly or in groups.



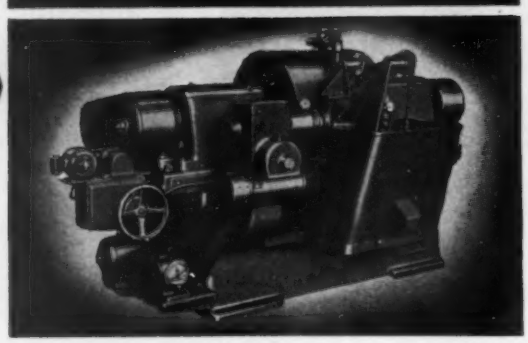
HYDRAULIC TRAVELING TABLE FACE GRINDER

A new, practical, time- and money-saving method of machining quality finishes on a wide variety of work.



DOUBLE SPINDLE DISC GRINDER

For high-speed grinding of two opposite parallel faces at the same time.



PEAK surface grinding efficiency comes only from using the right type of grinder for the job. Too often a compromise results in unsatisfactory production rates, difficulty in obtaining specified finishes, unnecessarily high grinding costs and delayed deliveries. Why not place the responsibility of determining just which type of surface grinder will most efficiently handle your work in the hands of Hanchett engineers? They are in a position to give you unprejudiced judgment because Hanchett builds a complete line of surface grinders of all types.

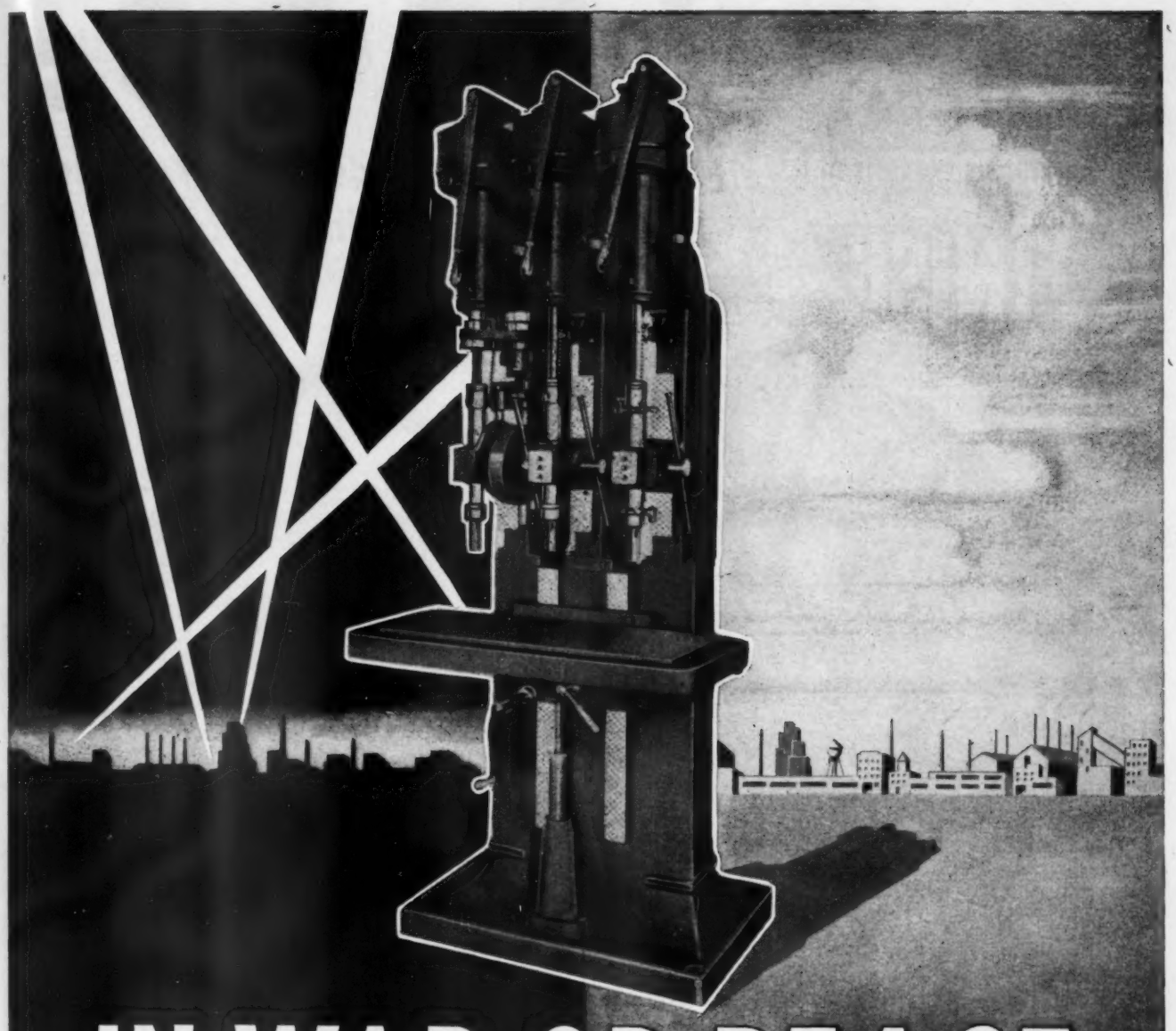
Write today—ask for Cat-alog No. 170 A-3.

HANCHETT GRINDERS — BIG RAPIDS MICHIGAN

IF IT'S A FLAT SURFACE—THERE'S A HANCHETT TO GRIND IT

HANCHETT MANUFACTURING CO.

BIG RAPIDS, MICHIGAN U.S.A.



IN WAR OR PEACE

● Avey Drilling machines fill a distinct need where small hole drilling is required. Today thousands of Avey spindles are working 7 days a week, 24 hours a day on vital war jobs. Tomorrow — they will be easily converted to peace time products — will produce work at costs which will enable you to sell in competitive markets.

Above is shown the MA-6 equipped with three spindles, — Avey-matic, Hand Feed and Tapper. This Avey Drilling Machine, Type MA-6 is furnished in No. 2 size (7/8" capacity in cast iron), No. 3 size (1 1/4" capacity in cast iron) — in units of one to six spindles. Push button control. Six speed machine, two speed motor with three mechanical changes through gearing.

ARMY E NAVY

AVEY DRILLING MACHINE CO.
CINCINNATI, OHIO, U. S. A.

CINCINNATI · OHIO

Avey DRILLING MACHINES

ROTO
THE STURGIS PRODUCTS CO.
STURGIS • MICHIGAN
Trademark Reg. U. S. Pat. Office
FINISH

LEADS!

The Only Outstanding Improvement In Tumbling in 50 Years

THE country's leading war producers have shown that the Roto-Finish process is the major and outstanding development in mechanical finishing. Today in hundred of plants, it is making tremendous time and labor savings on a wide range of work.

Roto-Finish is highly successful on steel, brass, aluminum, stainless and nickel steels. It can be varied from a severe grinding action to the finest surface finishing. It is being used on castings up to 75 pounds . . . and on delicate, intricate small parts weighing but a fraction of an ounce — parts never before successfully finished mechanically.

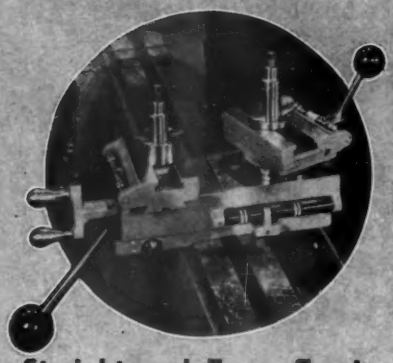
Roto-Finish eliminates tedious hand grinding and polishing — production bottlenecks — and gives a more uniform finish than obtainable by hand. Users of this versatile process have cut finishing and deburring costs as much as 96%!

Ask us to process sample parts for you — free, of course — and find out exactly what Roto-Finish can do for you. Hundreds of others have been astounded!

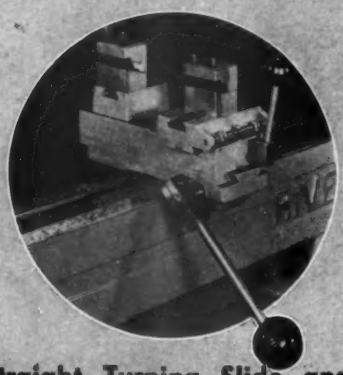
THE STURGIS PRODUCTS CO.
202 JACOB STREET • STURGIS, MICHIGAN

RIVETT

FOR BAR OR INDIVIDUALLY CHUCKED WORK REQUIRING UP TO EIGHT SUCCESSIVE OPERATIONS



Straight and Taper Turning Slides



Straight Turning Slide and Fixed Block

Cutting-Off and Forming Blocks

The Rivett No. 918 Hand Screw Machine incorporates precision, balanced design and operating features to make it an efficient producer on small duplicate parts. Work requiring up to eight successive operations can be finish-machined at one chucking. Bar stock passed through spindle may be held in push-out collet, while work individually chucked may be held in draw-in collet, step chuck or jaw chuck. In combination with six turret operations, double tool slide may be set up for straight or taper turning, forming or cutting-off.

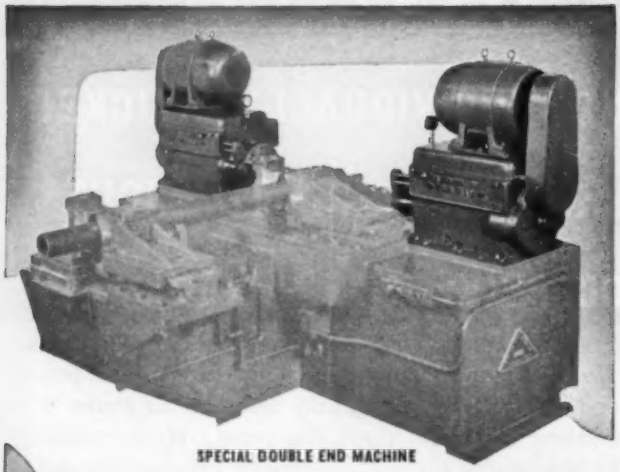
Other combinations are available using chasing bar for internal or external threading, or compound slide rest with turret tool post. Steel cabinet mounting has rimmed top and sump for cutting oil. Bench mounting is optional.

SPECIFICATIONS

Swing over bed, dia.	9"
Distance between spindle mouth and face of turret	
With draw-in collet	14½"
With push-out collet	13½"
Collet capacity:	
Draw-in type, max. dia.	1"
Push-out type, max. dia.	1"
Step chuck capacity, max. dia.	6"
Jaw chuck capacity, max. dia.	6"
Spindle capacity, max. dia.	1⅛"
Travel of turret slide, max.	4½"
Number of tool holes in turret	6
Dia. and depth of tool holes	¾" x 1"
Swing over double tool slide	4½"
Cross travel of double tool slide	3"
Travel of straight turning slide	2¼"
Travel of taper turning slide	2¼"
Spindle speeds, eight forward and reverse:	
Low range	150 to 2500 r.p.m.
High range	225 to 3750 r.p.m.
Weight of hand screw machine, mounting and drive, net	900 lbs.

RIVETT LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS.

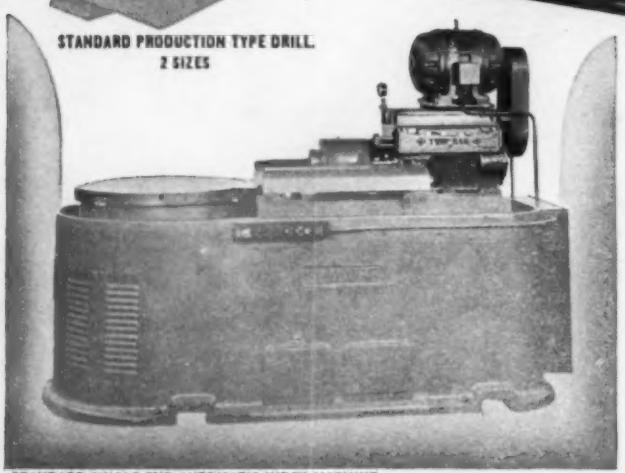


SPECIAL DOUBLE END MACHINE

IT'S SIMPLE "To Make" A MACHINE NOW —if You Have a TWIN RAM MASTER UNIT

A COMPLETE SELF-CONTAINED HYDRAULIC POWER UNIT

STANDARD PRODUCTION TYPE DRILL. 2 SIZES



STANDARD SINGLE END AUTOMATIC INDEX MACHINE

You can change this unit from one base to another, or rearrange your setup on the same bed, as your requirements dictate. It's practically as flexible as a motor; only pick-off gears necessary for speed changes—units provide infinite feeds. Twin Ram Unit can be used for wide range of applications—drilling (single or multiple spindle), reaming, boring, counterboring, spotfacing. Uniform pressure behind load is always in a straight line—the two rams prevent twisting action. Two sizes available. Capacity up to 2" in steel. Can be made to operate manually or automatically by remote control—for either right or left hand operation—with spindle rotation in either direction.

Send for folder giving complete information—spindle speeds and feed rates.

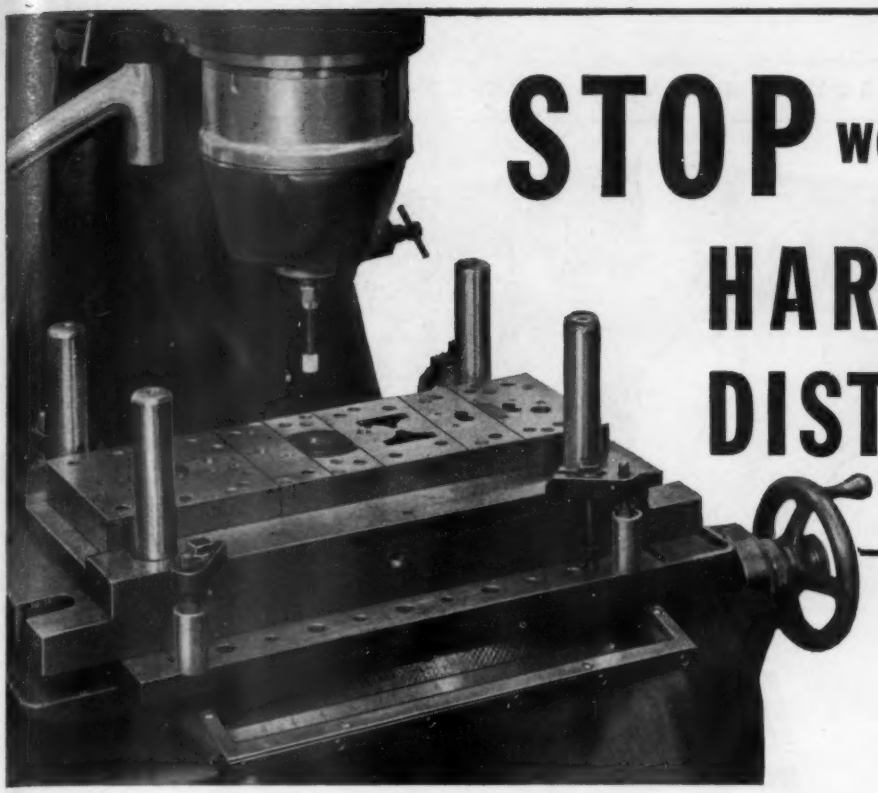
We invite inquiries regarding postwar plans.

BUY WAR BONDS

LeMaire TOOL & MFG. CO.

2665 S. TELEGRAPH ROAD ▲ DEARBORN, MICHIGAN

ENGINEERS AND BUILDERS OF PRODUCTION MACHINES



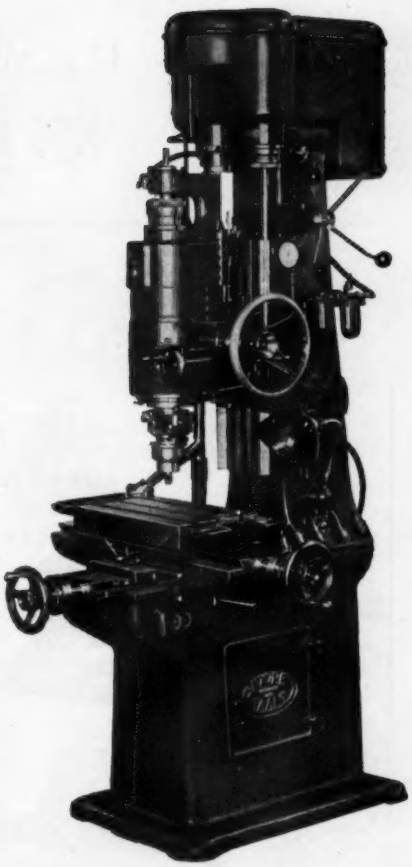
STOP worrying about HARDENING DISTORTION!

USE THE MOORE JIG GRINDER

How would you do this job without a Moore Jig Grinder? Most likely you would swing each of the six sections up on an internal grinder, going through all of the laborious steps of centralizing, locating, indicating, grinding, re-assembling and checking. With the Moore Jig Grinder you do it all in one setting, with the die completely assembled in its own die-set and located on its own dowels—*in one-quarter the time!*

Until recently, distortion due to hardening was a bugaboo in the production of tools and dies for precision parts. Correcting the position of holes after hardening was a costly, highly skilled, and, at best, makeshift process. But with the Moore development of the Jig Grinder, a machine new to tool-and-die practice, you can now with speed and ease relocate your holes and finish-grind them, straight or tapered, *within .0001".*

The Jig Grinder was created in the Moore toolrooms by Moore tool-and-die specialists specifically to solve the problem of hardening distortion on dies, drill jigs, master plates and precision gage parts. Besides saving toolroom time, it increases the life of a die from two to twenty times that of an unground die. It has a capacity to grind holes from .030" to 4", accuracy of screws of .00005" per inch, and grinding speeds of 15,000, 25,000 and 45,000 RPM.



Partner in Production

Moore Jig Borer bores the holes in these die sections before hardening, thus holding the location as close as possible to eliminate excessive grinding. Send for literature on both machines.

MOORE SPECIAL TOOL CO., INC · BRIDGEPORT, CONN.

MOORE MADE TOOLS

MOORE JIG BORERS AND JIG GRINDERS · PARTNERS IN PRODUCTION

Official U. S. Signal Corps Photograph.

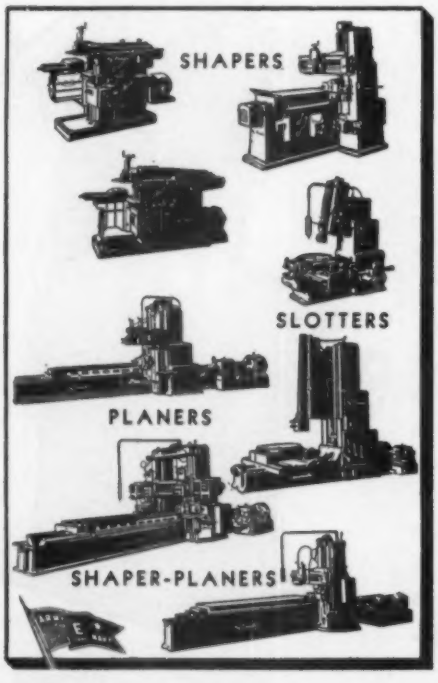
On the alert; soldiers attend church fully equipped.

Official U. S. Navy Photograph.

Officers and men of a U.S. warship kneel in prayer

RECIPROCATING
Hy-Draulic
MACHINE TOOLS

For Peace on Earth . . . Soon
Good Will Toward Men, Always



New Years, Christmas, Thanksgiving . . . War knows no holidays. But they who fight the battles pause to pray, and that is good. Likewise all of us who make the tools and weapons for war might well pause and pray for lasting peace on earth with good will toward men. And we should *look to our tools* carefully, as our brothers-in-arms look to their weapons, so that we shall maintain peak production of everything needed to win victory and peace soon.

What about your shapers, planers, slotters, shaper-planers? Have you enough for peak production on all war work? Have you any that are obsolete or badly worn? Unless you have *enough,* for sure; and all of *latest design,* good-as-new . . . then investigate Hy-Draulic Shapers, Planers, Slotters and Shaper-Planers. You will find exclusive Hy-Draulic features and advantages that give you maximum cutting and peak production on a wide variety of military jobs now and on commercial work after victory. Write today for details. Just mention the type of tool you can use, and ask for Bulletin 1106.

4335

Hy-Draulic
Reg. U S Pat. Off.

Shapers . . Planers . . Slotters . . Shaper-Planers
ROCKFORD MACHINE TOOL CO.
ROCKFORD, ILLINOIS, U.S.A.

DoALL BAND FILER

DoALL work table adjustment—from 10° back to 30° forward—simple, quick and POSITIVE.

DoALL Band Filer—provides substantial economies in production, tooling and maintenance work on all types of metals, wood, fibre and plastics.

Production Filing TO "DIE-FIT" TOLERANCES

Flat or shaped surfaces—acute or right angles or bevels—internal or external—all are precision filed at amazing speed because of DoALL positive work controls.

Widest selectivity in file size, shape, cut and speed for every type of work; rigid file back and work table adjustment; all these assure precise *file-broaching* output in important volume!

Investigate the greater production advantages of DoALL Band Filing—telephone your nearest DoALL Sales Office—now!

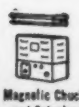
FREE Skilled engineering service for a time and method study of your filing problem—bring or send work specimens!

Contour Machines

The Zephyr

Band Filer

Surface Grinders


Magnetic Chucks and Selectron

Variable Speed Pulleys

Dust Collectors, Coolant Systems

Grinding Wheels

Cutting Oils

Band Saws

Band Files

Gage Blocks

Gage Instruments

DoALL **SALES OFFICES IN PRINCIPAL CITIES**

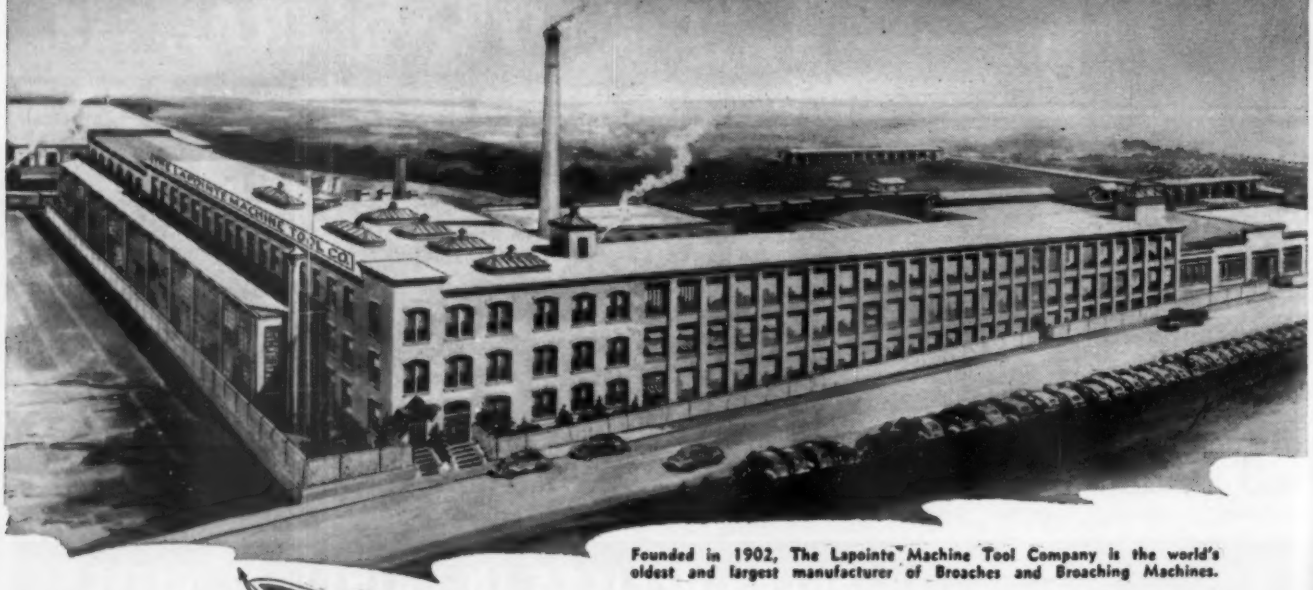
BAND FILER *Made by* CONTINENTAL MACHINES, INC.
Address Inquiries to 1301 S. Washington Ave., Minneapolis 4, Minn.

INDUSTRY'S NEW SET OF TOOLS SOLD AND SERVICED BY 34 DoALL OFFICES

SOMETHING OLD *and* SOMETHING NEW

This is the story of broaching . . . Broaching — the machining operation which has so vastly changed the cost on mass production precision parts . . . Broaching — which is as old as man's search for tools, as new as tomorrow's dreams.

At the turn of the century the demand for mass production precision parts welcomed with open arms the Lapointe invention of the pull principle in broaching and the development of engineered design in broaches and broaching machines. America's mass production dates from this beginning. It was by broaching that the automobile industry and dozens of other producers of consumer goods were able to mass produce interchangeable parts. It is by broaching that aircraft and armament parts are exceeding production schedules. It will be by broaching that thousands of products from safety razors to steam shovels will be made better, quicker and cheaper.



Founded in 1902, The Lapointe Machine Tool Company is the world's oldest and largest manufacturer of Broaches and Broaching Machines.

ARMY E NAVY

The LAPOINTE Machine Tool Company

HUDSON, MASSACHUSETTS, U. S. A

THIS IS NEWS *Look it Today*

rder-Type, Four-Sided Saw-Frame — 25% longer sustained cutting accuracy . . .

Rigid, Blade Backing-Plate — 33% more cutting speed . . . positive blade lift . . . no bowing . . . no dragging . . .

Finger-Tip Vernier Adjustment of Feed Pressure minimum blade breakage . . .

Self-Cleaning Coolant Pump — 75% more coolant capacity . . .

Greater Rigidity — 33% more rigid throughout . . .

No Other Metal Cutting Saw Like PEERLESS

None other is so fast, so accurate, so effective in saving time and metal. The reason for Peerless Hydra-Cut superiority is in the Saw-Frame assembly. Only in Peerless Metal Sawing Machines does the Four-Sided Saw-Frame surround the blade and the work. The blade is locked securely in place. The Backing-Plate Blade-Support gives added rigidity and accuracy and prevents bowing. The reciprocating action is counterbalanced by a cushioning cylinder. Dual hydraulic feed cylinders maintain an even steady pressure on the blade.

The Saw-Frame Guide operates on four bearings, with hardened and ground inserts. Its accurately controlled travel gives accurate cutting. The connecting rod drives from the center-line of the Saw-Frame. Smooth operation and split-hair accuracy are assured.

Only in Peerless Metal Sawing Machines is this outstanding combination of features offered. They have made the Peerless Hydra-Cut preferred for high-speed, precision cutting. Now, with added improvements, Peerless gives substantial assurance of even higher speed with split-hair accuracy, safety, and low maintenance.

PEERLESS MACHINE COMPANY, *1600 Junction Avenue, Racine, Wisconsin*
Builders of Fine Tools for Thirty Years

MAIL THE COUPON
for your copy of the
NEW PEERLESS CATALOG

• • •

Get *all* the new facts about Peerless Metal Sawing Machines, and the story about time tested improvements which will help set new standards in postwar production. Mail the coupon now!

PEERLESS
Metal Cutting Saws

FAST ACCURATE CUTTING DEMANDS PEERLESS BLADE CONTROL

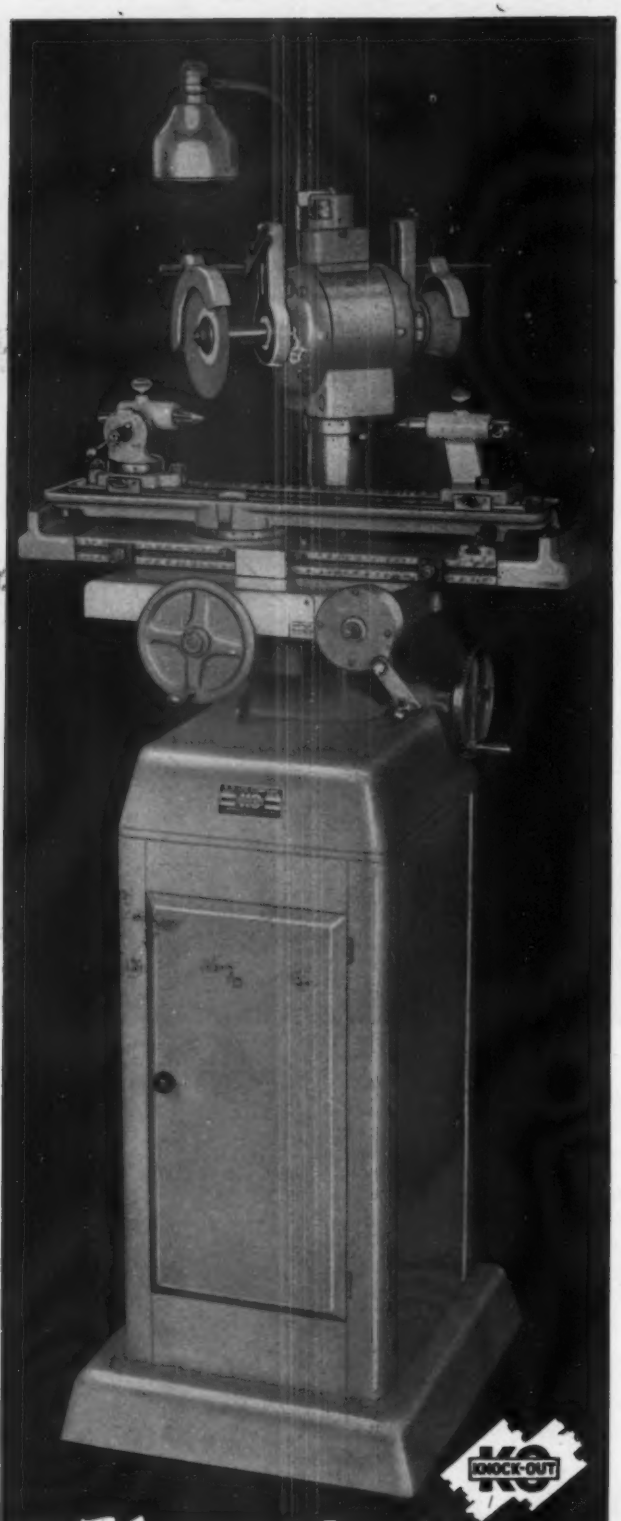
Peerless Machine Co., Dept. AM-144, Racine, Wis.
Send the new 12 page catalog, giving specifications, cutting time estimates, and average blade life of the Hydra-Cut.

Company_____

Individual_____

Street_____

City_____ State_____



KNOCK-OUT

Knock-Out

UNIVERSAL
TOOL GRINDER

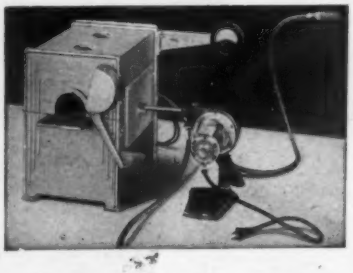
Write for Bulletin UTG-43-A. M.

K. O. LEE COMPANY
ABERDEEN SOUTH DAKOTA

"Stark"

ELECTROBLAST

High speed heat in twenty minutes



Powerful Torch used separately as a handy portable flame. $30.

High speed Muffle Furnace, no scaling or decarburization, at 7c per hour quickly saves its cost. Muffle 7" x 3⅛" x 2⅛". $40.

Also a larger furnace with built-in torch, muffle 7" x 4⅛" x 3½".

Hydrogen Brazing Furnace as shown above, range 1300-2400 F.

Especially adapted for the correct brazing of carbide-tipped tools; also for clean hardening of high speed and carbon tools.

Sold with complete equipment (except hydrogen tank) with directions, ready for use.

STARK TOOL CO.

ESTABLISHED 1862 WALTHAM, MASS.

Originators of the American Bench Lathe

LUCAS "PRECISION"

Horizontal Boring, Drilling and Milling Machine

THE LUCAS MACHINE TOOL CO.

NOW AND ALWAYS OF

CLEVELAND
OHIO, U. S. A.

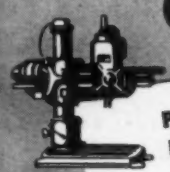
SMITH & MILLS

CRANK SHAPERS

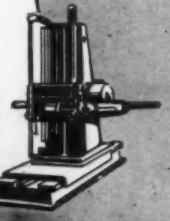
sizes 12" to 32" stroke

THE SMITH & MILLS CO. Cincinnati, Ohio

GILBERT

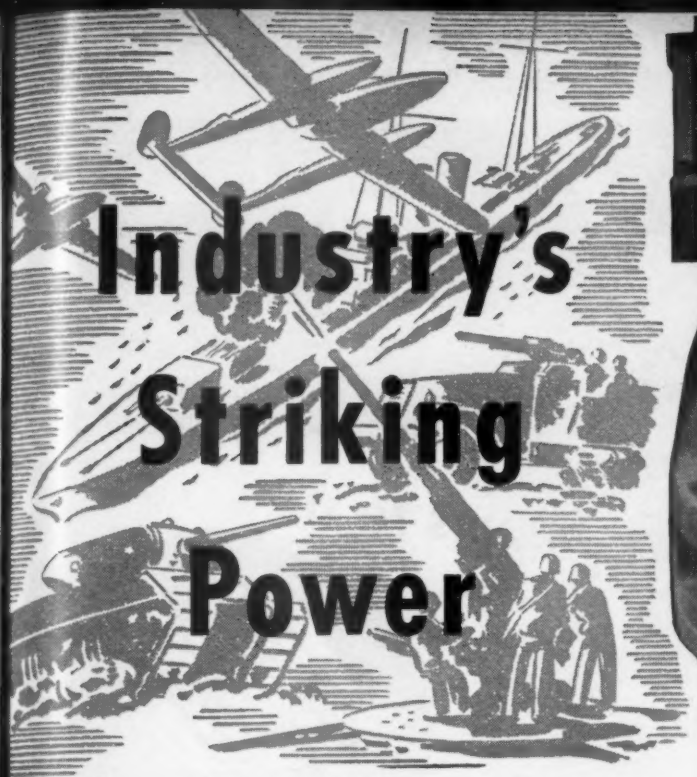


PRODUCTION SPEEDING
RADIAL DRILLS
AND
HORIZONTAL
DRILLING, BORING
AND MILLING
MACHINES



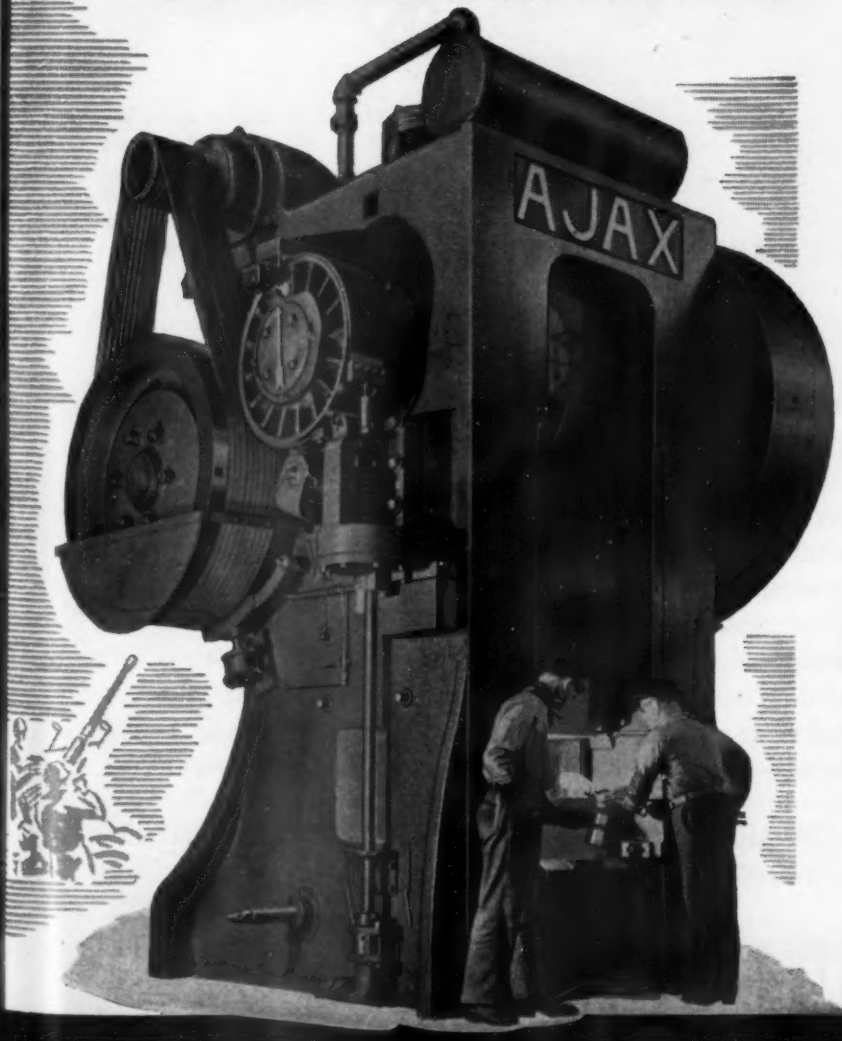
DETAILS ON REQUEST

THE CINCINNATI GILBERT MACHINE TOOL CO.
CINCINNATI, OHIO



Industry's Striking Power

for Forging the Products of WAR and PEACE



Today, in forge shops all over the country AJAX Forging Machines and Forging Presses are performing a vital role in the high speed production of material for war, such as parts for ships, guns, tanks, airplanes, bombs and shells—adding their full share to industry's all out effort toward speeding victory. And when that goal has been attained and the requirements for war are curtailed, with merely changing of the dies these same machines and presses will produce, economically at high production rates, accurately forged parts for automobiles, refrigerators, farm implements, railroad cars, and many, many more products to immediately meet the requirements of a new and greater peacetime economy.

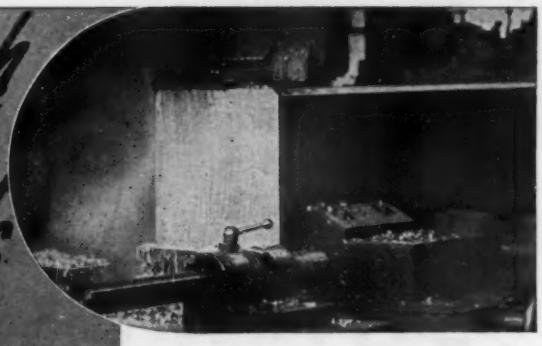
Write for Descriptive Bulletins.

THE AJAX MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND, OHIO

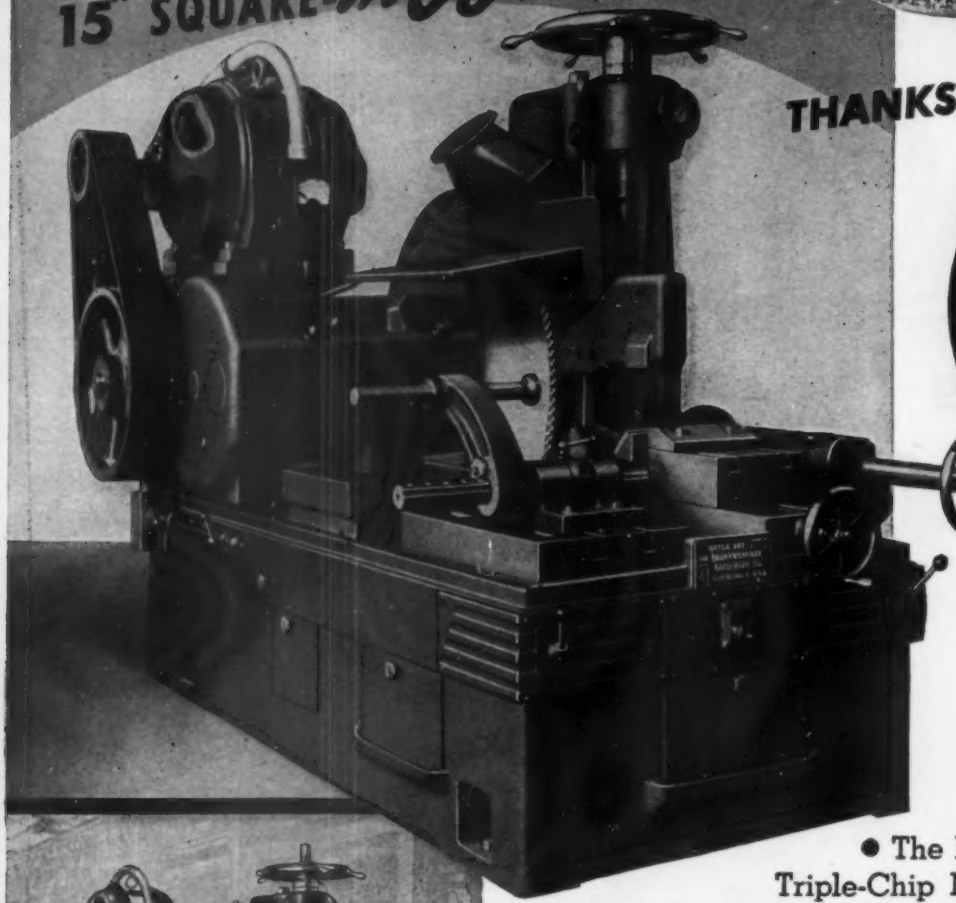
621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

It went Right Through
51-S ALUMINUM ALLOY
15" SQUARE—*in 35 Seconds*

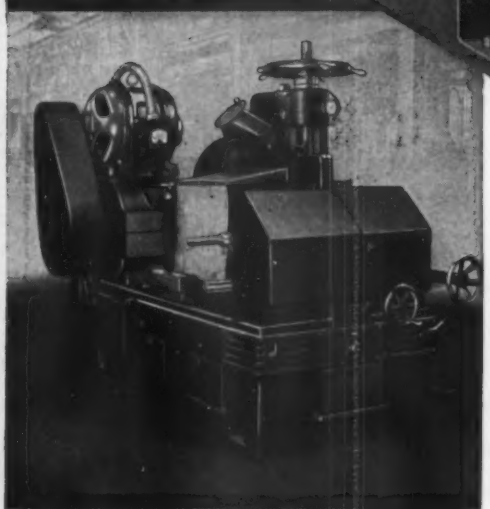


THANKS TO THE

Triple-Chip METHOD



Motch & Merryweather No. 4 High Single Speed Machine for cold sawing aluminum. Also No. 3 size. Also both sizes for cutting all non-ferrous metals.



Motch & Merryweather design confines flying chips and protects the operator by a simple but effective set of guards.

● The Motch & Merryweather Triple-Chip Method has licked the problem of cold sawing the *non*-ferrous metals, especially aluminum. For the first time, the difficulties caused by chips have been overcome, because our exclusive suction system disposes of them, preventing their accumulation and consequent shut-downs. The 35-second performance noted above speaks for speed — for the angle of production and profit. Such remarkable records are due to the successful development and correlation of "all 3"—machine, blade and blade sharpener — by one manufacturer, Motch & Merryweather.

THE MOTCH & MERRYWEATHER MACHINERY COMPANY
Penton Building • Cleveland 13, Ohio

Built by **MOTCH & MERRYWEATHER**

THE MOTCH AND MERRYWEATHER MACHINERY CO
CLEVELAND CINCINNATI DETROIT PITTSBURGH

PLAN-O-MILLING

"FIRSTS" WITH PLAN-O-MILL

- 1st to install General Electric's remarkable new Thy-mo-trol electronic feed control!
- 1st planetary to mill external threads with standard multiple thread cutter!
- 1st planetary to coordinate feeds and speeds!
- 1st to provide absolute control of feed-in!

FAST, ACCURATE MILLING OF CYLINDRICAL FORMS

You get the speed and high production of special purpose equipment when you replace wasteful, obsolete machines with Plan-O-Mill.

Yet Plan-O-Mill is flexible. A slight tooling change adapts it to a wide variety of thread milling and form milling jobs.

Plan-O-Mill saves manpower too! It is semi-automatic, can be operated by semi-skilled or unskilled labor. One man or woman can operate two or more Plan-O-Mills.

Find out about Plan-O-Mill today! Contact your machinery supplier or write direct.

PLAN-O-MILL
CORPORATION
1511 East Eight Mile Road · Hazel Park, Michigan

The Only Solution to Tool Scarcities

Make Your Tools Last Longer!

Increasing war production goals combined with scarcities of high speed steel for cutting tools seems like a dangerous dilemma—but it can be solved by keeping present tools in perfect cutting condition, correctly resharpened, conditioned to stand up under the tough demands of three-shift seven-day wartime schedules.

In plants all over the country where essential battle equipment is being turned out, the **Oliver No. 2 ARC Face Mill Grinder** (illustrated) is helping conquer these scarcities by keeping face mills at top operating efficiency.

Consider these advantages: (1) Grinds the correct face and periphery on all types of face mills, creating a round corner between these two surfaces, thus decreasing danger of cutter breakage caused by sharp corners. (2) Performs these operations in one continuous movement, thus making it necessary to index the cutter only one-third the number of times—a real hour-saver. (3) Requires only a few simple adjustments to set up for any cutter from 6" to 26" in diameter, for any radius from 0 deg. to 90 deg., for any angle of "dish," plus or minus.

Assure the fastest, most accurate and efficient performance on every face mill in your plant by reconditioning them the Oliver way. (No. 2-A Machine, not illustrated, available for smaller work, 1" to 6" dia.)

OLIVER INSTRUMENT CO.
1410 E. Maumee St., Adrian, Michigan

Don't Neglect Your Toolroom It's the Backbone of Production!

Oliver
OF ADRIAN

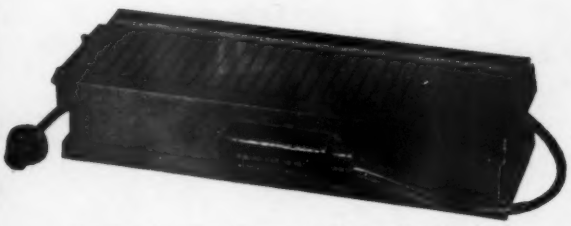
AUTOMATIC DRILL GRINDERS — TOOL AND CUTTER GRINDERS — DRILL POINT THINNERS — TEMPLATE TOOL GRINDERS — FACE MILL GRINDERS — DIEMAKING MACHINES

Walker Rotary Magnetic chuck with Concentric Gap—Style D—Face Plate—Walker Rotary Chucks are made in sizes from 4" to 72" diameter with Face Plate construction adapted to the work to be held.

STEP UP WAR PRODUCTION by saving set-up time with WALKER MAGNETIC CHUCKS*

Walker No. 617 Bar Pole Face Rectangular Magnetic Chuck, for holding small thin work. Sizes range from 6" x 10" to 12" x 60".

Walker Universal Swivelling Magnetic Chuck sizes 5" x 10", 4" x 20" and 4" x 30"—can be arranged with Vernier Reading.



Walker No. 618 Rectangular Magnetic Chuck—available in sizes from 4" x 8" to 30" x 96".

WALKER DEMAGNETIZERS

These units are available from Walker in standard D.C. and A.C. types for 110 or 220 V service. They provide a fast and convenient means of removing residual magnetism from a wide variety of parts. Send for Circular K7 giving detailed information.

•

Because of their ability to hold work securely under heavy cuts, Walker Magnetic Chucks fit into the demand for high production of war materials. Then, too, these dependable units contribute to more and better work in less time.

Of proved design and utmost dependability, Walker Magnetic Chucks in Rectangular and Rotary Types help speed up grinding, milling, planing and turning operations. Standard units are available for practically any chucking need. A complete range of sizes makes it possible to select exactly the right Walker for your problem. Magnetic chucks for special requirements can be furnished in reasonably short time.

Come to Walker for magnetic chucks and you'll save time and speed up war production.

Write for catalog No. W4 giving complete information

O. S. WALKER CO., Inc.

Worcester, Mass., U.S.A.

When peace comes we'll be ready...

In times of peace prepare for war, and in times of war prepare for peace.

Today with top pressure on every machine tool manufacturer, scarcity of materials, and shortage of machinists, there can be no change in design or construction. Production must continue at full speed, so the design in each size of Axelson Lathes has been frozen. Not so the thinking of engineering and development departments. Draftsmen and engineers are working constantly to take full advantage of the lessons learned from case histories of Axelson Lathes operating today under toughest conditions and unusual jobs.

Axelson Lathes are at work in war plants throughout the United States and abroad. They're in the arctics and in the tropics, they're on land and on sea, always giving uniformly satisfactory performance. From the performance reports on these lathes operating under every conceivable condition, Axelson engineers are studying ways and means to build greater improvements and even better performance into Axelson Lathes after the war is over. New materials are being analyzed, new designs are being checked, possible ways to increase power and cut down operating costs are being developed. You will be able in postwar years to benefit through this conscientious research carried on in the midst of wartime production.

For over 25 years Axelson has been manufacturing lathes which have established a reputation for quality and satisfactory performance. These lathes are available in 14, 16, 18, 20, 25, and 32 inch sizes and of varying lengths.

Write for descriptive literature.

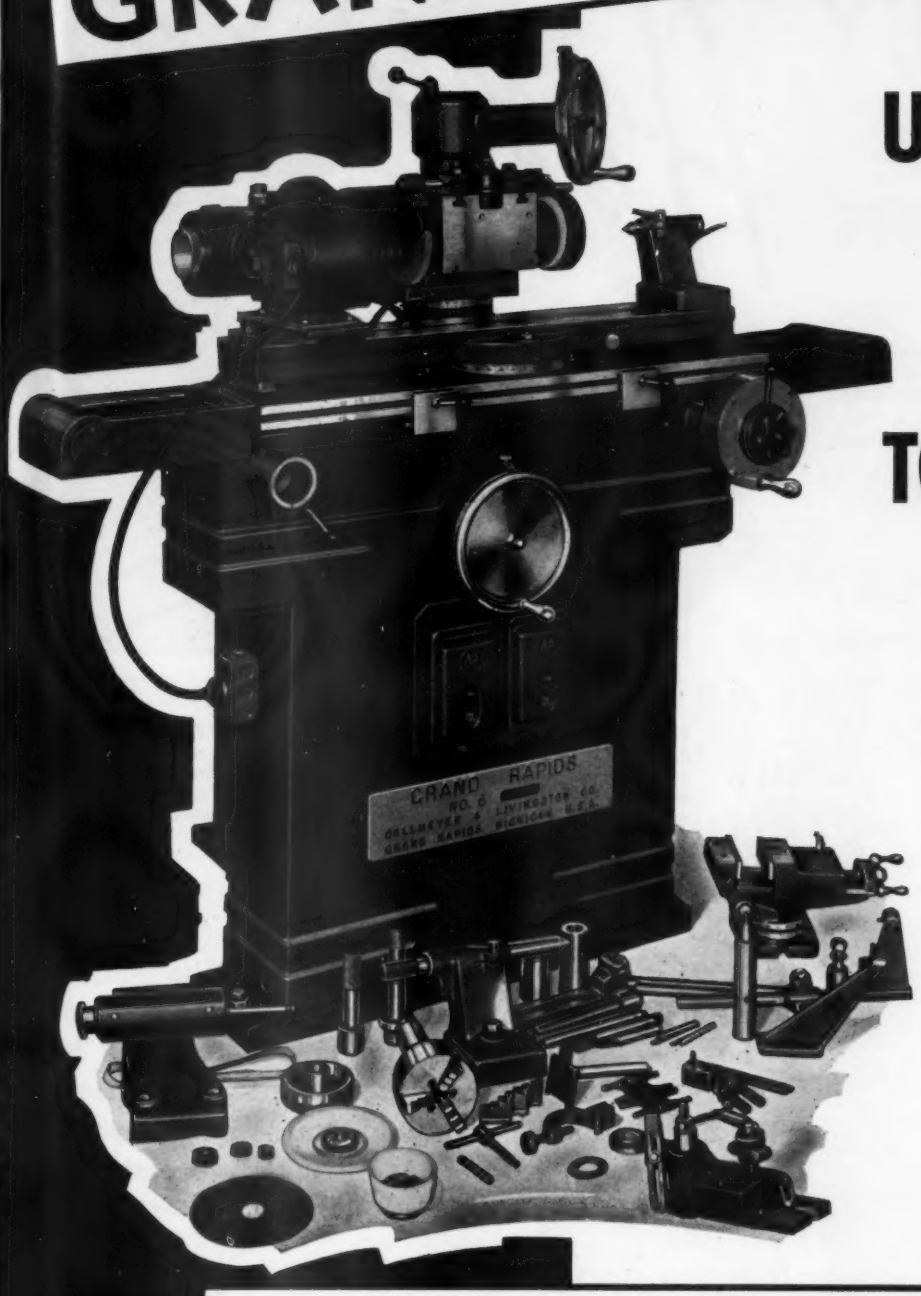
AXELSON MANUFACTURING CO.
6160 S. BOYLE AVE., LOS ANGELES, CALIF.
(P. O. Box 98, Vernon Station)
50 Church Street, New York City, New York
3844 Walsh Street, St. Louis, Missouri

AXELSON LATHES

DEPENDABLE FOR OVER A QUARTER CENTURY

GRAND RAPIDS

No. 6 UNIVERSAL CUTTER and TOOL GRINDER



Here is one of the latest achievements of the GALLMEYER & LIVINGSTON COMPANY, designers and builders of the famous Grand Rapids Grinders. It is illustrated and described in bulletin 11-141 which is yours for the asking.

Check these Features

1. Cabinet base construction
2. Ball bearing table
3. Fixed table height
4. Hardened and ground stainless steel table ways
5. Cross feeding of column rather than table, enabling operator to stand up close to his machine
6. Convenient location of all controls
7. All wheel shafts mounted in grease-sealed ball bearings
8. Quill type precision ball bearing spindle
9. Master hand wheel for longitudinal table movement provides for additional table speeds
10. Provision for built-in dust collector

GALLMEYER & LIVINGSTON CO.

330 STRAIGHT AVE. S. W.

GRAND RAPIDS, MICHIGAN

ACCURACY Assured

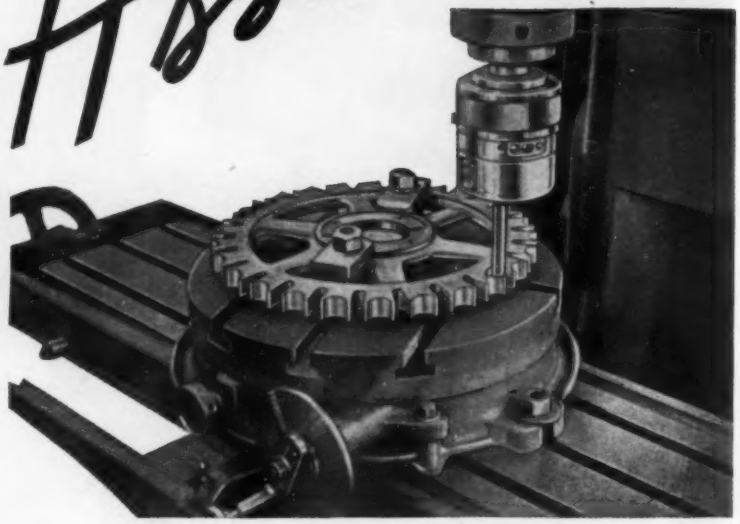
ALL-PURPOSE

KNIGHT-Millers'

provide accurate results — all at one setting — on such light milling operations as profiling, milling, boring, slotting, and keyway cutting because of wide range of spindle speeds, solid table unit, and ease of handling.

. . . also, accuracy that meets today's rigid inspection for finish and tolerances when doing heavy milling of large forgings — a result of KNIGHT Miller power and rigidity.

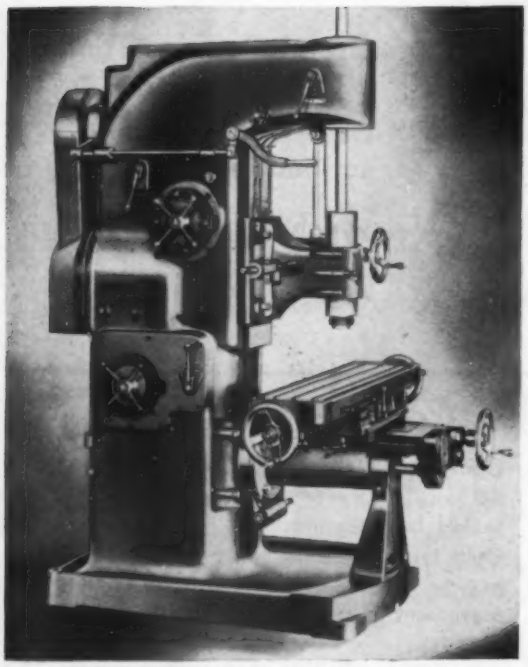
★



ACCURACY EXAMPLE

The geneva cam in this picture illustrates a typical job requiring accurate milling, boring, and spacing. The slots between the cam tracks had to be the same width and depth, the cam tracks all the same radius, and the spacing from center to center of each exactly the same. This was done quickly, as well as accurately, on a KNIGHT Miller equipped with indexing rotary table.

KNIGHT VERSATILE MILLERS ACCURATE - RIGID



KNIGHT Millers are fast, compact, complete and convenient to handle. Write for our catalog that pictures and describes various jobs being done.

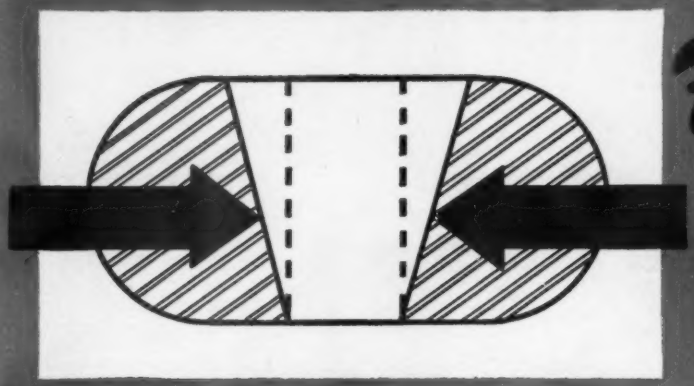
Among the reasons for accurate results with a KNIGHT Miller are an ingenious yet simple method of holding, driving, and changing cutters that is positive, quick, and dependable, assuring true running cutters that will not work out. A single set of controls governing the action of the machine is simple, easy, and convenient to manipulate.

In boring, a rigid accurately fitted spindle, running on precision roller bearings, insures round and straight holes, while the precisely fitted table makes certain that holes will be in alignment. Dial indicator equipment makes the exact location of each hole quick and easy. In milling, the depth of cut is easily changed and final, exact depth maintained by spindle adjustment. Thus, in every operation, the design of the KNIGHT Miller means assured accuracy.

KNIGHT Millers subject to prior order for immediate delivery. Write for catalog.

W. B. KNIGHT MACHINERY CO.
• ST. LOUIS, MISSOURI •

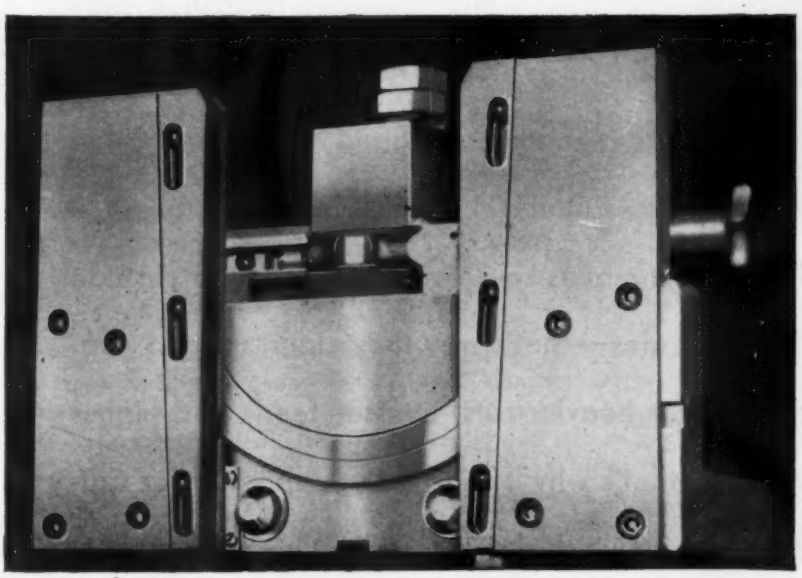
Two NON-PARALLEL SURFACES *Broached* USING THIS *One* FIXTURE



ANOTHER EXAMPLE OF HOW DETROIT BROACH ENGINEERS DEVELOP NEW APPLICATIONS IN BROACHING

The fixture shown here was designed and built by Detroit Broach Company to provide the necessary rigidity and at the same time provide a means for turning the part several degrees. Thus it is possible to broach non-parallel surfaces in one stroke of the ram.

It is work of this kind that has made Detroit Broach Company famous throughout the country for doing things with broaches that others have called impossible. Broaching can increase speed . . . improve accuracy . . . in many manufacturing operations. Broaching will solve many of your production problems. Write Detroit Broach Company today.



ARMY NAVY

DETROIT BROACH COMPANY

20201 SHERWOOD AVENUE • DETROIT, MICHIGAN

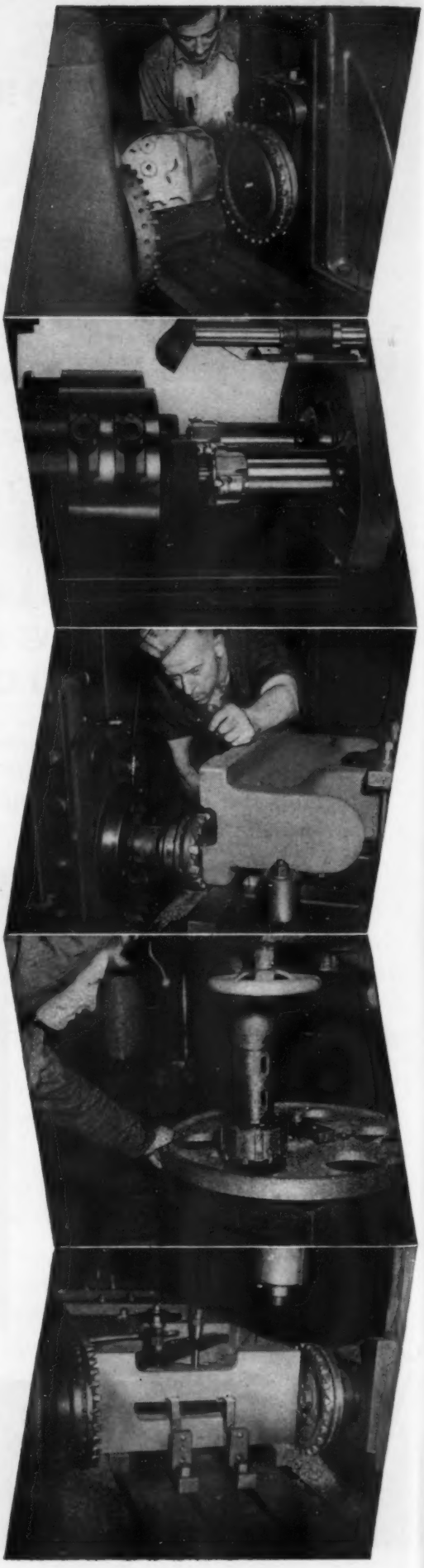
9308 SANTA MONICA BLVD. • BEVERLY HILLS, CALIFORNIA

CARBIDE TIPPED

LOVEJOY MILLING CUTTER BLADES

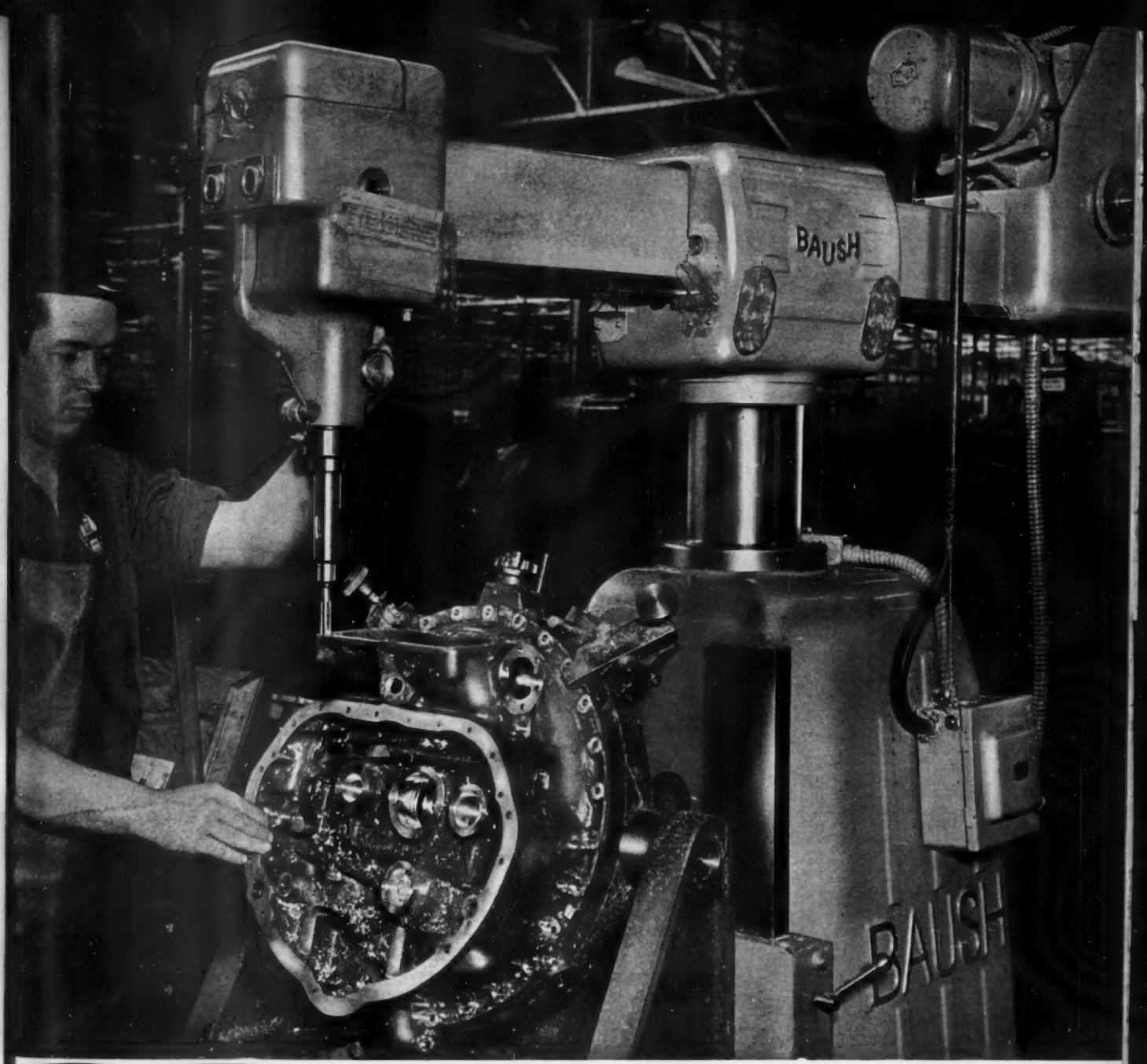
for

HEAVIER CUTS
COARSER FEEDS
HIGHER SPEEDS



The trend is to carbides! But this modern cutting alloy presents certain problems. Will the machine stand the higher speeds and heavier feeds? And how about the cutter? Modern machine tools are built to take this extra strain—and so are modern Lovejoy Milling Cutters. Nowhere else can you find the rigidity in interchangeable milling cutters found in Lovejoy Cutters. Solid forged steel housings, plus *positive-locking* blades make a rugged combination that puts Lovejoy Cutters in a class with solid cutters. That's what makes Lovejoy Cutters ideal for carbide tipped blades—that's why they stand up and produce under heavier cuts, coarser feeds and higher speeds—that's why it will pay you to write for Catalog No. 26 which shows the complete Lovejoy line.

LOVEJOY
TOOL COMPANY, Inc.
SPRINGFIELD, VERMONT, U.S.A.



BAUSH
QUIPMENT
helps build the
"big 3"
Packard-Rolls Royce,
Pratt & Whitney,
Wright Aeronautical
IRCRAFT ENGINES

Speed tapping TO A CLASS 3 FIT

Baush Machine Tools are extensively used in the intricate, accurate, speedy manufacture of engines of war — for aircraft, for Navy and merchant ships, for the Army's mechanized equipment. Illustrated is one of these Baush Tools, the popular and efficient Precision Tapping Machine, set up in a mid-western plant for tapping on Pratt & Whitney aircraft engine parts. As set up above, seven holes are tapped around the carburetor pad . . six holes tapped inside carburetor pad . . six more tapped around a circular boss . . four in the selector valve pad . . **all tapped to a Class 3 fit!** Although production figures are confidential it is obvious that Baush Precision Tapping Machines deliver outstanding performances.

Details on all Baush Machine Tools upon Request

BAUSH

MACHINE TOOL COMPANY
SPRINGFIELD, MASS.
DETROIT, MICH.

MEANS BUSINESS

These Two "on the job" photos show a Hendey Lathe and a line of Hendey Shapers giving 24-hour service in the toolroom of a large West-Coast Aircraft manufacturer.

-the-Clock AIRCRAFT PRODUCTION

..KEPT AT TOP EFFICIENCY AND ACCURACY WITH

Hendey

HIGH-SPEED PRECISION-PRODUCTION LATHES AND SHAPERS

To meet the ever-growing demand for "PLANES AND MORE PLANES" for far-flung battle-fronts, the Aircraft Industry is producing these "Ships" at an unparalleled rate.

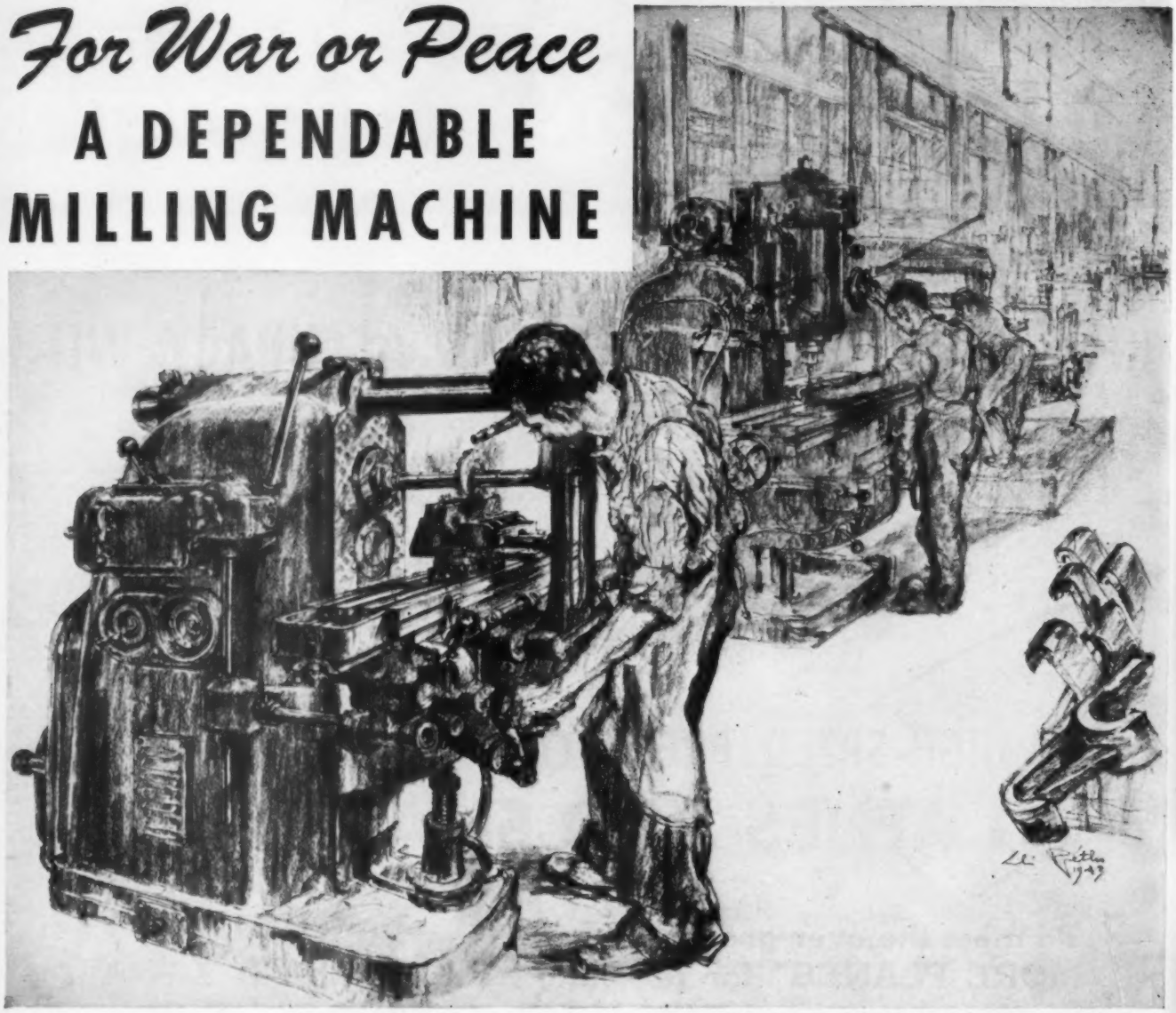
In toolrooms and production departments of leading aircraft plants from coast to coast, Hendey Lathes and Shapers are doing yeoman duty on this huge assignment.

Wartime schedules call for sturdiness and power coupled with speed in production—where the work turned out consists of combat jobs that MUST FULFILL. It is in these schedules that HENDEY LATHES AND SHAPERS are giving their full measure of capacity backed with High Precision.

HENDEY MACHINE CO. TORRINGTON CONNECTICUT

BRANCH OFFICES: BOSTON NEW YORK ROCHESTER DETROIT CHICAGO

For War or Peace
A DEPENDABLE MILLING MACHINE



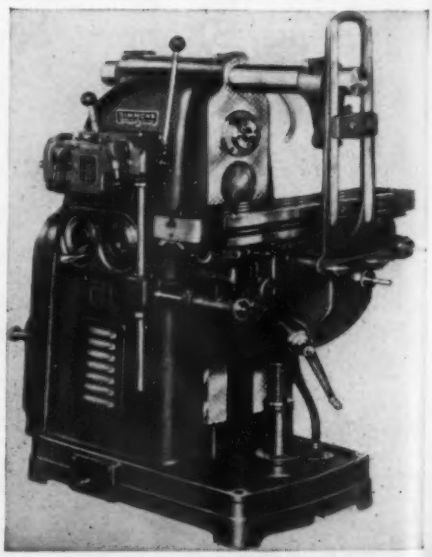
Simmons No. 1A Micro-Miller, Drawn by Lili Rethi

★ SIMMONS HAS PRODUCED a machine particularly adapted to the requirements of the manufacturing and jobbing shop for the milling of miscellaneous parts. The No. 1A Micro-Miller is *low in cost, sturdy and simple to operate.*

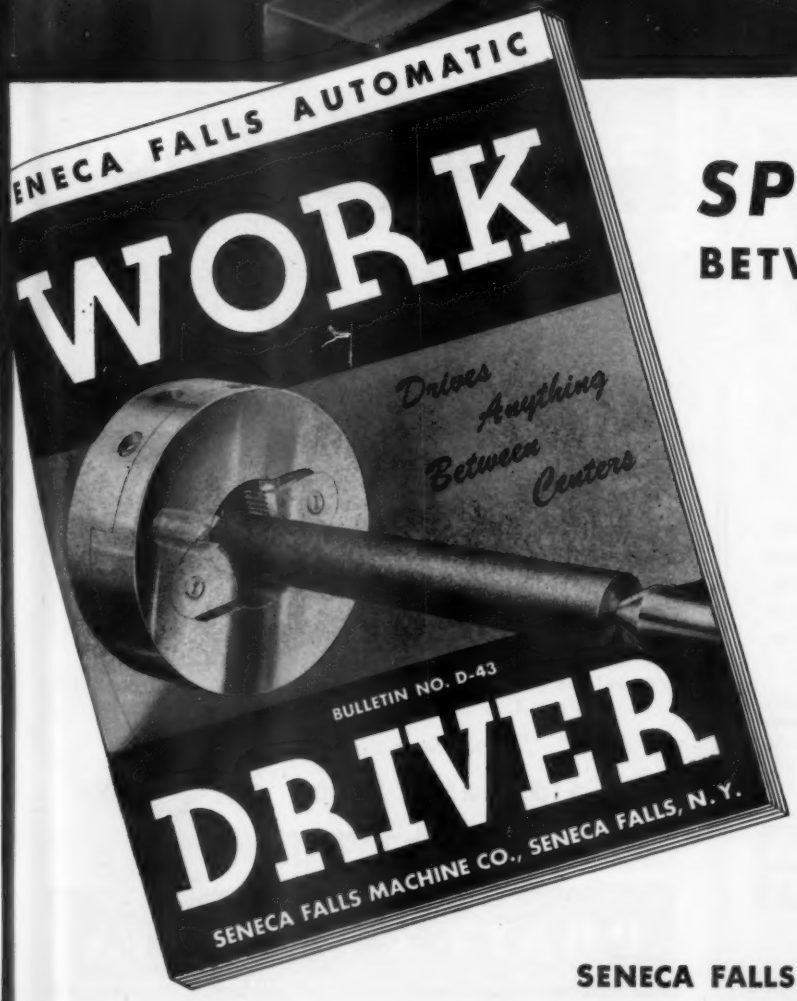
★ Because of the ease of operation and close grouping of all controls, it is equally efficient on production runs as well as limited quantities requiring frequent set-ups. All control levers are grouped on the left side within immediate reach of the operator.

★ Within the one-piece column and base is the patented Simmons *Micro-Speed Drive* unit, providing an infinite number of spindle speeds throughout two speed ranges. The correct spindle speed is immediately available by turning the Selector Dial while the spindle is in operation. This is particularly useful when using the newer Tungsten Carbide cutters, which provide maximum production and tool life.

★ Investigate the merits of this compact miller by writing today for complete details. Simmons Machine Tool Corporation, 1759 North Broadway, Albany 1, New York.



Simmons-Built MACHINE TOOLS



SPEED UP YOUR BETWEEN-CENTERS WORK

The Seneca Falls Automatic Work Driver is a self-centering, quick-acting Driver designed to eliminate dogging time, thus permitting one operator to operate two or more machines. Its positive grip prevents slippage and resulting tool breakage. It provides greater safety for the operator since there are no projecting screws or sharp corners to catch clothing or injure hands. It can be used on any type of engine lathe, multiple tool lathe and on plain or universal grinders. Can also be used for certain work on turret lathes.

Now available in eighteen *standardized* models which can be ordered from our new catalog. Write for your copy today and utilize this proven Driver to help speed your war production.

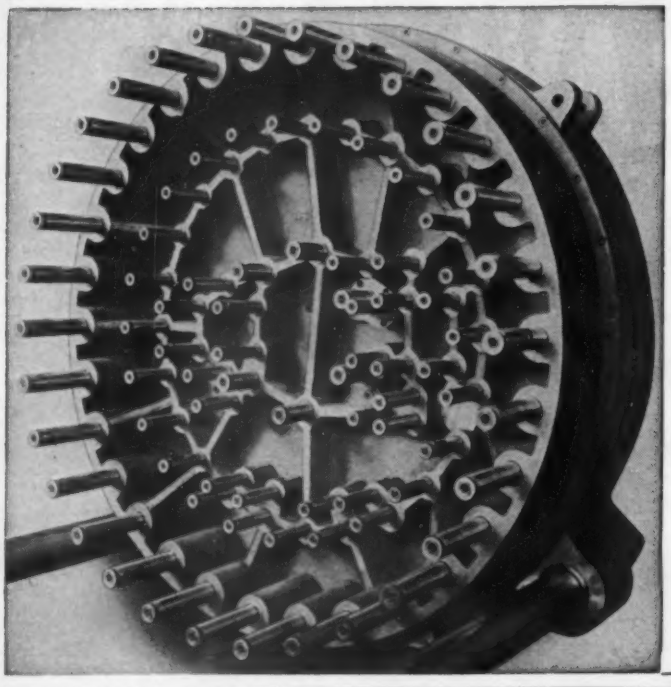
SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

LATHE NEWS from SENECA FALLS

Buhr

MULTIPLE SPINDLE DRILL HEADS

are engineered, designed and built by men of long experience in this field



A TYPICAL EXAMPLE IS THIS 82 SPINDLE BUHR HORIZONTAL DRILL HEAD . . . *for drilling*

32 - .257
14 - 5/16
36 - 17/32 dia. holes.

This is the right hand head of a 2-way Hydraulic Horizontal Machine.

All spindles and gears are of alloy steel heat treated and ground, ball bearings are used throughout and an oil pump keeps them in a bath of oil. Vertical adjustment is provided in all spindles to compensate for unequal drill lengths and to adjust drills to proper depth.

BUHR MACHINE TOOL COMPANY
Green and Davis
ANN ARBOR MICH.

Specialists in Multiple Spindle Drilling, Boring, Reaming, Tapping Equipment.

IDEAL SPEED LATHES

are performing secondary-finishing operations on small metal and plastic parts – more quickly, more accurately, at lower cost! Ideal for polishing, de-burring, lapping, filing. Quality engineered. Built for precision performance in continuous, 24-hour-per-day service!

A size and type for every purpose. With air-cooled, dust-free single or two-speed motor; conventional or special holding devices; exclusive, automatic brake, etc. State your problem. Write for Catalog No. 440.

SCHAUER MACHINE COMPANY
ORIGINATORS OF TODAY'S SPEED LATHES
2067 READING ROAD ··· CINCINNATI 2, OHIO

SIGOURNEY M-100

PRECISION DRILLING MACHINE

The Sigourney M-100 Drilling Machine is designed specifically for use in critical drilling where close tolerances must be maintained. Unusually sturdy construction to meet 24 hour production schedules . . . enclosed design to insure operating safety . . . sealed ball bearings throughout . . . hardened and ground spindles . . . speeds from 4000 to 10,000 R.P.M. . . . available in 1, 2, 3, and 4 spindle models.

Detailed Bulletin on request.

THE SIGOURNEY TOOL CO.
Hartford 6, Conn.

Sole Sales Agents
PRATT & WHITNEY
Division Niles-Bement-Pond Co. - - - West Hartford, Connecticut

PLAN NOW WITH *Bodine* FOR POST-WAR CONVERSION

This message is directed to engineering and production executives who foresee the trend of their post-war conversion.

If high-speed, multiple spindle production of small parts is a requirement of new manufacturing schedules, we offer you the cooperation of Bodine engineers in planning suitable Bodine adaptations of our six standard sizes to cut time and costs in such production.

An investigation of the Bodine basic design will disclose that the automatic horizontal indexing dial may be factory-designed and spindles located to provide for an almost endless variety of set-ups. Among them may well be the ideal solution of your problems.

For high-speed repetitive production, especially where several operations are required on each part, Drilling, Milling and Tapping may be performed simultaneously during one cycle of tne dial. Screw inserting can also be added if necessary.

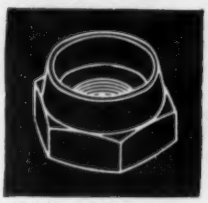
Six standard machines are made. They carry from 6 to 8 spindles, drill and tap holes to ½" dia. . . . and to 3½" in depth.

Tools may be set to operate *vertically, horizontally, diagonally* or from an *inverted* position — one or all planes simultaneously. Operator merely places the work in a clamp and tools operate at successive stations as the dial automatically indexes to position. Ejection is manual or automatic.

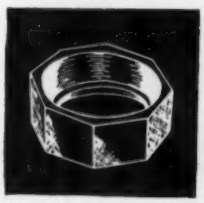
Electrical interlocks prevent damage to machine and tools... protect operator, Semi-skilled operators, especially women, can easily handle production at low fatigue factor.

Hole tapped, screw inserted, spinning, backing up, ejected.

7 holes drilled. (.5 mm. to 2.8 mm. dia.)



Drilling and tapping— 2 nuts to each stroke of machine.



Ream 2 diameters and seat — tap 1 9/16" — 12 T.P.I.

TYPICAL OPERATIONS

The four small parts shown herewith are typical of the work Bodine machines are doing at high speeds and with great accuracy. The number of operations which may be performed on each piece during one cycle of the dial is limited only by the number of spindles — 4 on the smallest machine — 8 on the largest.

Bodine machines are now available only for war work but their use has greatly increased. They are destined to take a prominent place in post-war production of small articles because of their demonstrated efficiency in turning out millions of ordnance components at low cost.

May we suggest that you investigate Bodine machines at an early date. Our engineers will gladly make recommendations from your blueprints or sample parts.

Write **FOR INFORMATIVE BULLETIN**

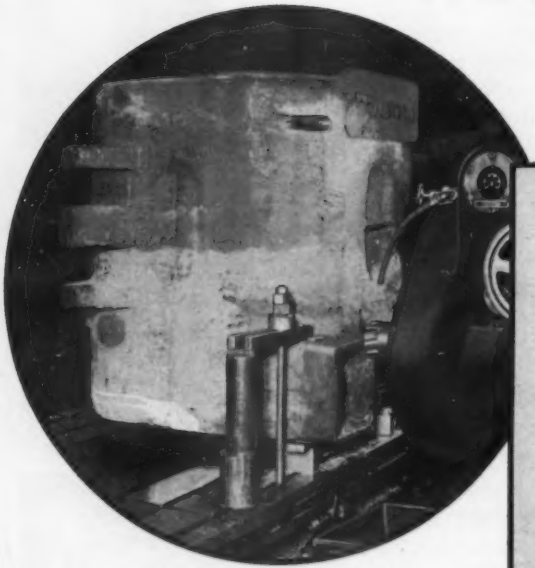
DRILLING, MILLING, TAPPING, SCREW INSERTING

Simultaneously

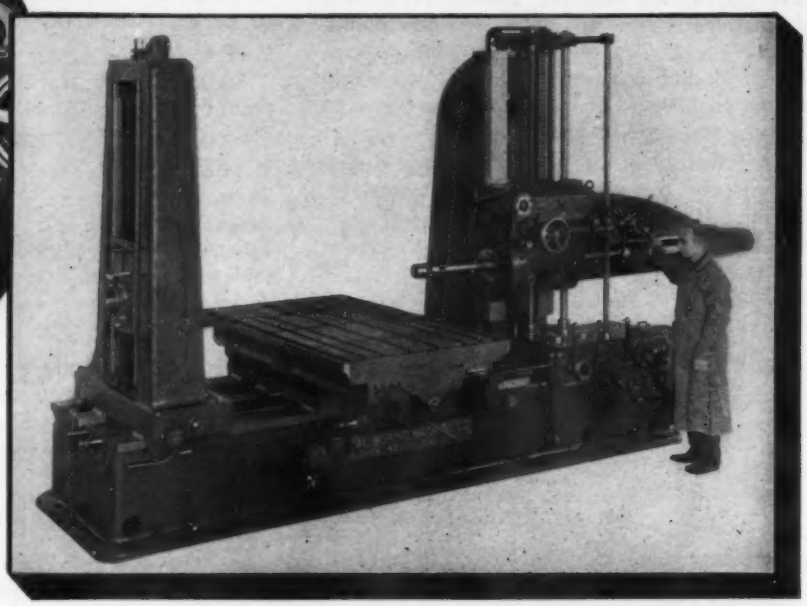
THE
Bodine
CORPORATION
BRIDGEPORT CONNECTICUT
AUTOMATIC DIAL TYPE DRILLING, MILLING, TAPPING, AND SCREW INSERTING MACHINES

HEAVY WORK HEAVY CUTS—

— TO CLOSEST TOLERANCES ON THE 4-INCH UNIVERSAL BORING MACHINE



MILLING DIESEL ENGINE FRAME FOR SWITCHING LOCOMOTIVE



1. Three Bed Ways — span 44 inches.
2. Table Semi-Box design, heavily ribbed.
3. Motor mounted directly on base.
4. Saddle lead screw nut mounted between guiding ways.
5. Centralized right hand control.
6. Heavy duty type — heaviest 4" spindle machine built.
7. One shot lubrication for head; also for saddle and table assembly.

Pile a good, heavy job on the 4" Universal, then take a husky cut. This will prove the stamina of the machine — especially when the tolerances are close.

A manufacturer of motors for diesel-electric switching engines uses a 4" Universal for face-milling around the air ducts, gear case lugs and brush holder pads on the motor frame.

Full advantage is taken of the Universal TRI-WAY Bed on jobs like this — the load is well distributed — alignment is assured — the work may be moved easily for setting up — or locked securely when under cut.

UNIVERSAL

BORING MACHINE COMPANY · HUDSON, MASS., U. S. A.

GORTON

FOR **50** YEARS
Specialists in *Tracer-Controlled* MILLING

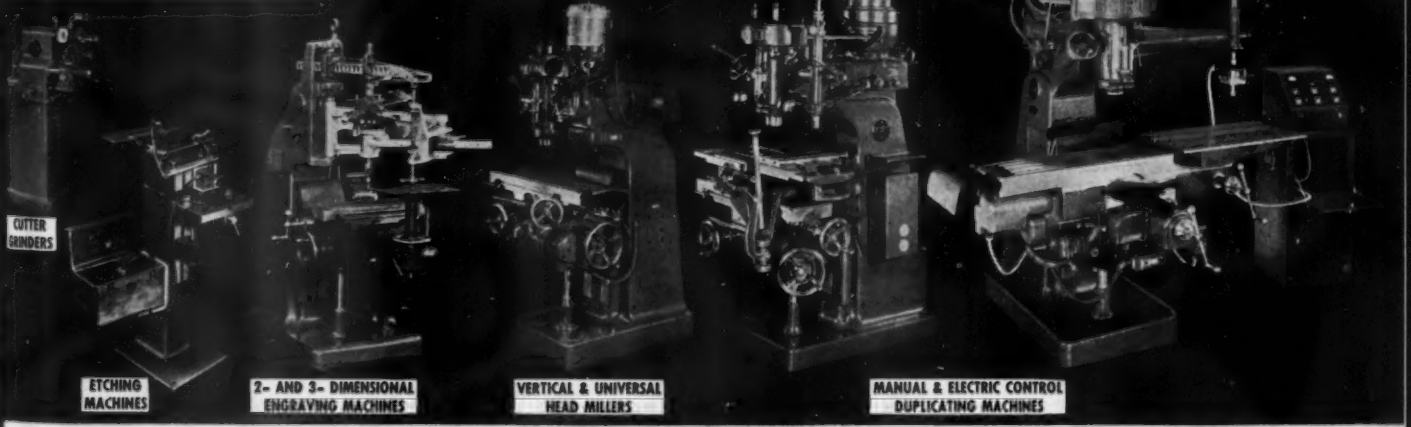
The Right Sized Machine for Every Die and Mold Job. Also Production Milling . . . Profiling

A *Complete* Service

MACHINES from 500 to 21,000 lbs.

SPINDLE SPEEDS from 33 to 12,000 rpm.

SPINDLES POWERED from ¼ to 10 hp.


CUTTER GRINDERS
ETCHING MACHINES
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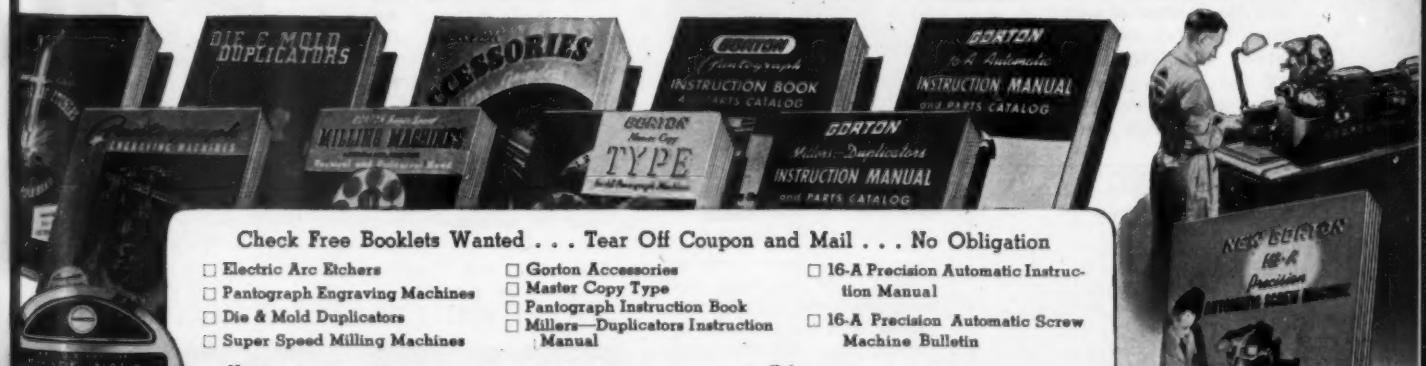
VERTICAL & UNIVERSAL HEAD MILLERS
MANUAL & ELECTRIC CONTROL DUPLICATING MACHINES


DIE & MOLD DUPLICATORS
ACCESSORIES
GORTON Pantograph INSTRUCTION BOOK & PARTS CATALOG
GORTON INSTRUCTION MANUAL and PARTS CATALOG
MILLING MACHINES
GORTON Master Copy TYPE
GORTON Millers—Duplicators INSTRUCTION MANUAL and PARTS CATALOG

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- ☐ Pantograph Instruction Book
- ☐ Millers—Duplicators Instruction Manual
- ☐ 16-A Precision Automatic Instruction Manual
- ☐ 16-A Precision Automatic Screw Machine Bulletin

Name_____ Title_____

Company Name_____ Address_____ State_____

GORTON
YEARS OF PRECISION TOOLS

GEORGE GORTON MACHINE CO.

1315 RACINE STREET, RACINE, WISCONSIN, U.S.A.

ADAMS

Gear Hobber and Thread Miller

Here is a versatile machine that will help you to produce precision gears on an uninterrupted schedule.

It excels in the production of multiple splined shafts, and it hobs spur gears and helical gears of any angle.

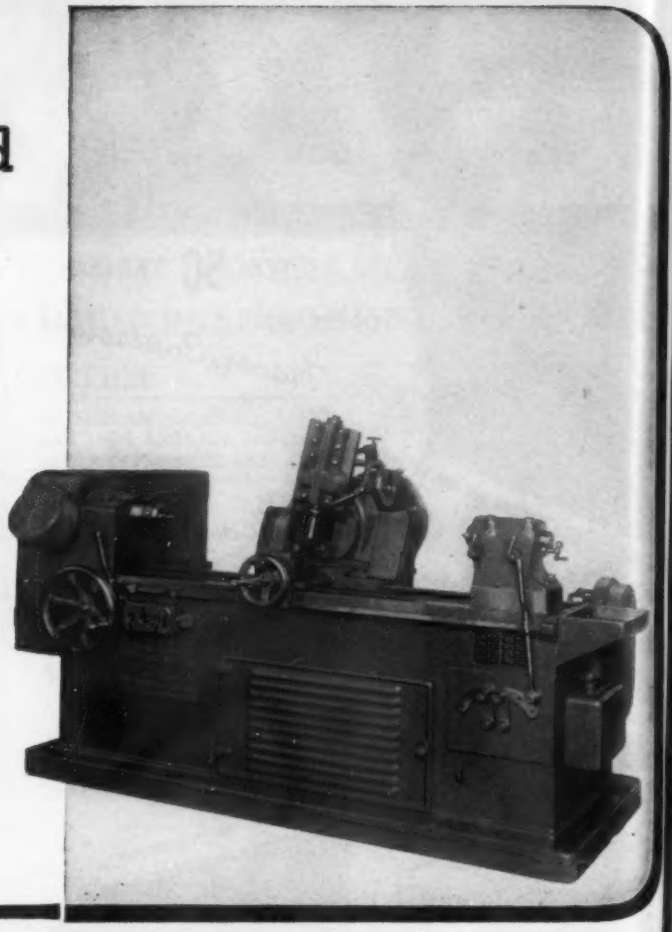
In addition, it functions as a thread miller on single or multiple threaded worms, lead and feed screws, etc.

Our catalog No. 501 contains full information. Do you want a copy?

THE ADAMS COMPANY

Est. 1883

1905 Bridge St. Dubuque, Iowa



SAW IT • • IT'S FASTER!

WITH Tannewitz METAL CUTTING BAND SAWS

Production increases of 50% to 100% in the cutting of sheet steel and non-ferrous metals—formed or flat—is the usual result of installing TANNEWITZ High Speed Metal Cutting Band Saws. The reason for this phenomenal production increase is due to the fact that these machines are precision built to provide better than two miles of vibrationless sawblade travel per minute and hence slide through the work with the greatest of ease. Many patented features put them entirely in a class by themselves. It'll pay you to get the complete facts. *Just ask for Metal Cutting Band Saw bulletin.*

KIND OF MATERIAL	THICKNESS AND FEED PER SECOND IN INCHES							
	1/32	1/16	1/8	1/4	1/2	1	2	3
Mild Steel	32-36	6	3	1				
Stainless Steel	6	2	1	-				
Yellow Brass, Zinc	24	12	6	3	1½	¾	⅜	3/16
Bronze or Copper	6	3	1½	¾	⅜	3/16		
Aluminum	28-36	18	9	4½	2	1½	1	¾
Duraluminum	24	12	6	3	1½	1	½	¼
Single Plymetal				6	4			
Double Plymetal				4	3			
Plywood	24-36	24	20	16	12	6	3	1½
Asbestos Board	12	6	3	1½	¾			
Fibre (Hard)	24	12	6	¾				
Paper Board	24	18	12	4	2	½		
Masonite	24	18	12	6	3	1½	¾	⅜
Bakelite	12	6	3	1½	¾	⅜	3/16	

Other bulletins worth writing for: "SINGLE AND VARIABLE SPEED BAND SAWS FOR FOUNDRY USE"; "BAND SAWS FOR DIE-SAWING"; "INSIDE AND OUTSIDE FILING AND POLISHING".

THE TANNEWITZ WORKS, GRAND RAPIDS, MICH.

UNIFORMLY HIGH QUALITY WORK

Assured by

WALTHAM CYLINDRICAL SUB-PRESSES

SAVE TIME BY PRODUCING CLEAN PARTS READY FOR ASSEMBLY

OVERHANG TYPE SUB-PRESS

Die work of much finer quality and uniformly closer precision is assured through the use of Waltham Sub-Presses. Valuable time can be saved with these tools because the cleaner stampings produced require no hand filing or finishing and are ready for assembly just as they come from the dies in Waltham Sub-Presses.

Carefully and sturdily constructed with easy adjustment for maintaining alignment, Waltham Sub-Presses can be depended on for highest accuracy at all times.

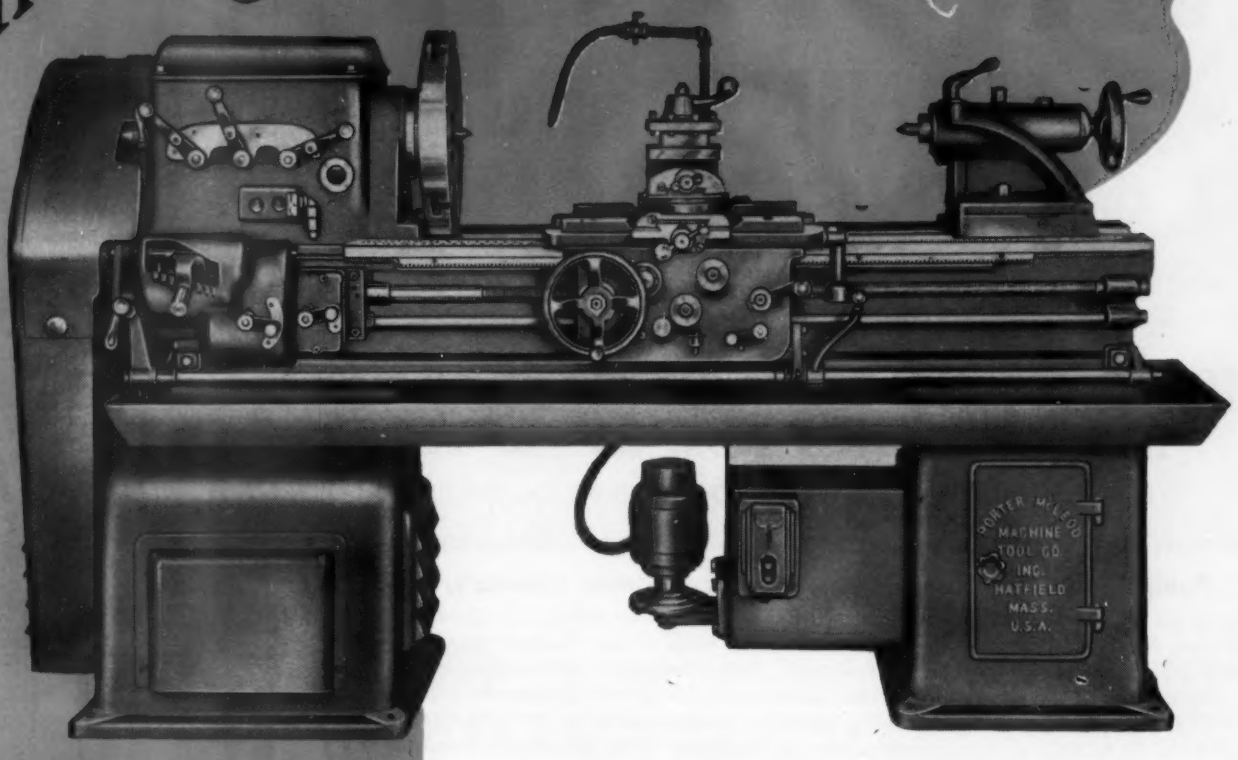
Both Arch and Overhang types in sizes up to 6" plunger diameter are available.

WRITE TODAY FOR DETAILS

WALTHAM MACHINE WORKS

WALTHAM, MASS.

Announcing PORTER-McLEOD ENGINE LATHES



SPECIFICATIONS

Swing over bed — 17"

Swing over carriage — 11½"

Distance between centers (6" bed — 36"

Hole through spindle — 1 5/16"

No threads and feed changes — 40

Lead screw threads per inch (Acme) 6

R.P.M. — 410

Highest gear ratio — 42 to 1

No spindle speeds — 12

Speeds — 15 to 500 R.P.M.

Write for illustrated literature giving detailed specifications.

Immediate Delivery on Proper Priorities.

16 INCH 12 SPEED GEARED HEAD QUICK CHANGE IN 6', 8', or 10' BED LENGTHS

Modern in every detail, sturdy in construction and offering features which assure the maximum in speed, convenience and accuracy.

Headstock — a full box section, internally ribbed and entirely self-contained. All gears of special alloy hardening chrome nickel steel.

Spindle — chrome nickel steel mounted front and rear on Timken roller bearings.

Tailstock — of cut-away design; spindle 2¼" dia.

Leadscrew — of special high-carbon lead screw stock.

Bed — a semi-steel casting planed to receive lead screw bearings and quick change gear box; bearing pads grooved to receive gear box tongue strips and lead screw bearings.

Apron — double walled; all gears run in oil; graduated dials on carriage, cross feed and compound rest screws may be set to zero by operator, eliminating necessity for calculating proper cuts.

Quick Change Gear Box — a unit mechanism, bolted to head; all gears and clutches of steel; feed changes can be made while cutting.

Motor — mounted inside cabinet leg.

Attachments — taper attachment; coolant system.

Write for information on the Porter-McLeod 8" Cold Metal Sawing Machine designed for both general and production work. Bars and shapes can be nested for fast multiple cutting.

Send for details covering the Porter-McLeod Wet Abrasive Cutting-Off Machine. Capacity 1½" diameter solid or 2" diameter tubing. Available in bench or pedestal types.

MACHINE TOOL COMPANY

PORTER-McLEOD
MACHINE TOOL CO. INC.
Hatfield, Massachusetts

A flexible machine that is the last word in simplicity of operation

HI-SPEED HONING and LAPPING MACHINE

for use with any standard make honing head

HONES CYLINDERS up to 20" in diameter . . . with STROKES from 20" to 72" . . .

IDEAL FOR PRODUCTION JOBS INVOLVING:

Aircraft parts . . . Ordnance parts . . . Diesel engines . . . Compressors . . . Pumps . . . Internal combustion engines . . . Steam cylinders, etc.

Speed up war work involving internal cylindrical surfaces by utilizing a HI-SPEED Honing Machine. When used with proper honing head of any standard make, the HI-SPEED machine produces accurate, straight, round, smooth bores—amazingly fast.

Unique positive stop and dwell system makes it possible to stop the spindle without shock or impact at the bottom of each stroke, at any point within the stroke range and hold the spindle without reciprocation, at that point up to 1½ minutes. Ideal for "blind hole" honing and straight line lapping or honing.

All controls are located at the front of the machine at the operator's station . . . No ladders to climb . . . Stroke setting, hone withdrawal, short stroking at any point, changes in speed of reciprocation or rotation of the spindle made instantly from operator's station.

The HI-SPEED Honing Machine is made in 4 sizes, any one of which can be had with strokes up to 72"... Designed for use with any standard make of honing head.

Tell us your requirements—and our engineers will promptly furnish you with complete information, prices and early delivery dates.

Illustrated is No. 0 Machine equipped for 36" stroke with 80" under the spindle.

NOTE THESE SPECIFICATIONS:

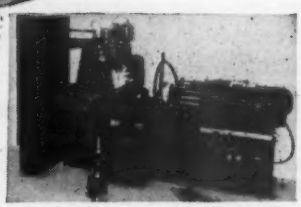
Model No.	No. 0	No. 1	No. 2	No. 3
Stroke (standard)	20"	36"	48"	72"
Working Base Area (standard).. Auxiliary Tables available	21" x 22"	31" x 31"	31" x 31"	48" x 54"
Height Under Spindle Nose (up).. Added Height Available on Order.	48"	60"	75"	100"
Spindle Diameter	2⅜"	2⅜"	2½"	2⅜"
Spindle Speeds Through Gear Box	4	4	4	8
Main Drive Motor (standard)....	7½ hp	10 hp	15 hp	20 hp
Coolant Pump Volume, Motor Driven	14 gpm	18 gpm	18 gpm	25 gpm
Maximum Bore possible to hone with standard spindle drive motor..	10" Dia.	12" Dia.	16" Dia.	20" Dia.
Maximum Overall Diameter of Cylinder possible to place on standard base	18"	27"	27"	44"
Floor Area	44"x60"	60"x80"	60"x80"	60"x108"
Overall Height	11'6"	15'3"	18'3"	23'8"

ARMY E NAVY

Over our factory flies the ARMY-NAVY "E"—awarded for excellence in the production of machinery and tools vitally needed to win the war.

AUTOMOTIVE MAINTENANCE MACHINERY CO.
2100 Commonwealth Avenue, North Chicago, Illinois

Now IS THE TIME TO CALL SNYDER TO HELP YOU PLAN MACHINES FOR PEACETIME PRODUCTION



SNYDER KNOWS HOW

This straight line index machine was developed by Snyder to expedite production of crankshafts for internal combustion engines. It drills, reams and taps flange holes, and miscellaneous holes in the small end of the crankshaft—a total of 10 holes. The production of this machine is 22 crankshafts an hour. With proper handling equipment, one man can operate a group of related machines. Continuous automatic cycle operation eliminates the time, labor and fatigue otherwise involved in handling a heavy part between steps and because unclamping and reclamping between steps is eliminated, a very high degree of accuracy is maintained. Machine can be changed over to handle another type crankshaft within an hour.

●When hats are in the air for victory, you'll be twice as happy if you can also throw your hat in the air for a post-war production plan that's complete and ready to go—ready for the swing-over to peacetime products and peacetime employment, both so necessary to post-war prosperity.

The time to complete that plan is NOW—before the clamor for production starts. Right now, there is time to study and analyze the product as a production project—time to consult the best production engineering brains—time to build the special-purpose machines that will give you the quantity, quality and economy that build markets, profits, and employment.

For twenty years, in peace and war, Snyder has been co-operating with leading American industries in solving production problems through the use of special-purpose machines that perform one or many operations, increase output, improve quality, reduce cost.

This experience is at your service now, in any degree that you may need—to consult on your production problems, to design and build the machines you need, or to build machines to your specifications. We invite you to write us in full confidence. *Snyder Tool & Engineering Company, 3400 E. Lafayette Ave., Detroit 7, Mich.*

PLAN Your PRODUCTION
when you
PLAN Your PRODUCT

SNYDER
DESIGNERS AND BUILDERS OF SPECIAL-PURPOSE MACHINES FOR HIGH PRODUCTION AT LOW UNIT COST

Years of Successful Co-operation with Leading American Industries

QUEEN CITY *Grinders*

WILL SAVE YOUR TOOLS!

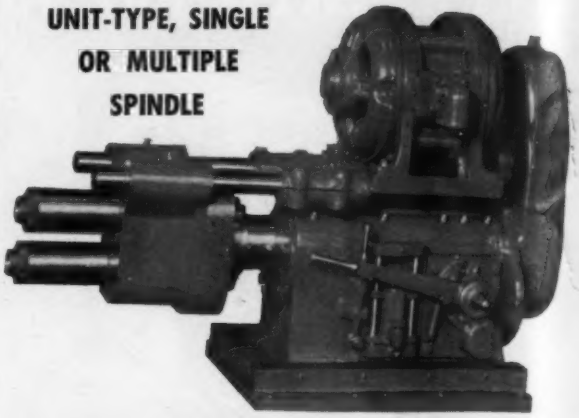
● Regularly sharpened tools will speed your work . . . increase accuracy and quality . . . save you time and money. Keep tools in top condition with a handy QUEEN CITY Grinder. We can supply Grinders in Bench, Pedestal and Heavy Duty Box Type Bases from 1 to 10 H.P. Each unit is supplied completely equipped . . . ready for immediate use.

Write today for the name of your closest QUEEN CITY Representative. Dealers located in all principal cities.

QUEEN CITY MACHINE TOOL CO.
218 EAST SECOND STREET
CINCINNATI 2 • • • • OHIO

DRILLING HEADS

UNIT-TYPE, SINGLE OR MULTIPLE SPINDLE



● For drilling, reaming, hollow milling, spot-facing, tapping, etc. Heads are equipped with standard ball bearing motors, ½ H.P. and ¾ H.P. sizes. Also, 1, 2, 3, 5 and 7½ H.P. sizes for heavy duty units. Spindle speeds from 2500 R.P.M. to 6000 R.P.M. according to requirements. Feeds from .00025" to .040". Cams and head-gears to suit your needs.

Write for your copy of our latest Bulletin.

The BRADFORD MACHINE TOOL Co
MANUFACTURERS OF METAL WORKING LATHES; CAM FEED DRILLING AND TAPPING EQUIPMENT, HYDRAULIC DRILLING MACHINES . . . IN BUSINESS SINCE 1840
659 EVANS AVE. . . . CINCINNATI, OHIO

Drilling and Tapping Machines
(Automatic and Semi-Automatic)
LELAND GIFFORD CO.
WORCESTER, MASS.

Giant KEYSEATERS
For cutting internal keyways, slots or splines 1/16" to 4" wide and up to 60" long. Fast—Accurate—Flexible. Write for particulars and catalog on machine for your work.
MITTS & MERRILL
913 Tilden St.
Saginaw, Michigan

MILLHOLLAND

Automatic DRILLING - BORING MILLING - TAPPING Units

½ to 20 HORSEPOWER DRIVE

AUTOMATIC and SEMI-AUTOMATIC PRODUCTION MACHINERY

W. K. MILLHOLLAND MACHINERY CO
Indianapolis, Ind.

GEARGRIND FORMED WHEEL GRINDING

for all types of production

TYPE SGG-12
60" Combination External Gear, Involute and Straight Spline Grinding Machine

In the tool room GEARGRIND Machines are grinding master gears, involute or straight sided spline gages and spline work arbors, plug gages for involute, V shaped or straight sided keys, many types of punches and dies, and master index plates.

On production runs, GEARGRIND Machines are doing magnificent work on external and internal gears, external and internal involute splines, straight splines, serrations and racks, as well as cluster gears and other gears of cramped design.

There are GEARGRIND Machines for grinding grooves on variable arcs. Other special machines are available or can be designed and built for special operations. Our general catalog gives full information.

The GEAR GRINDING MACHINE COMPANY
DETROIT 11, MICH. U.S.A.

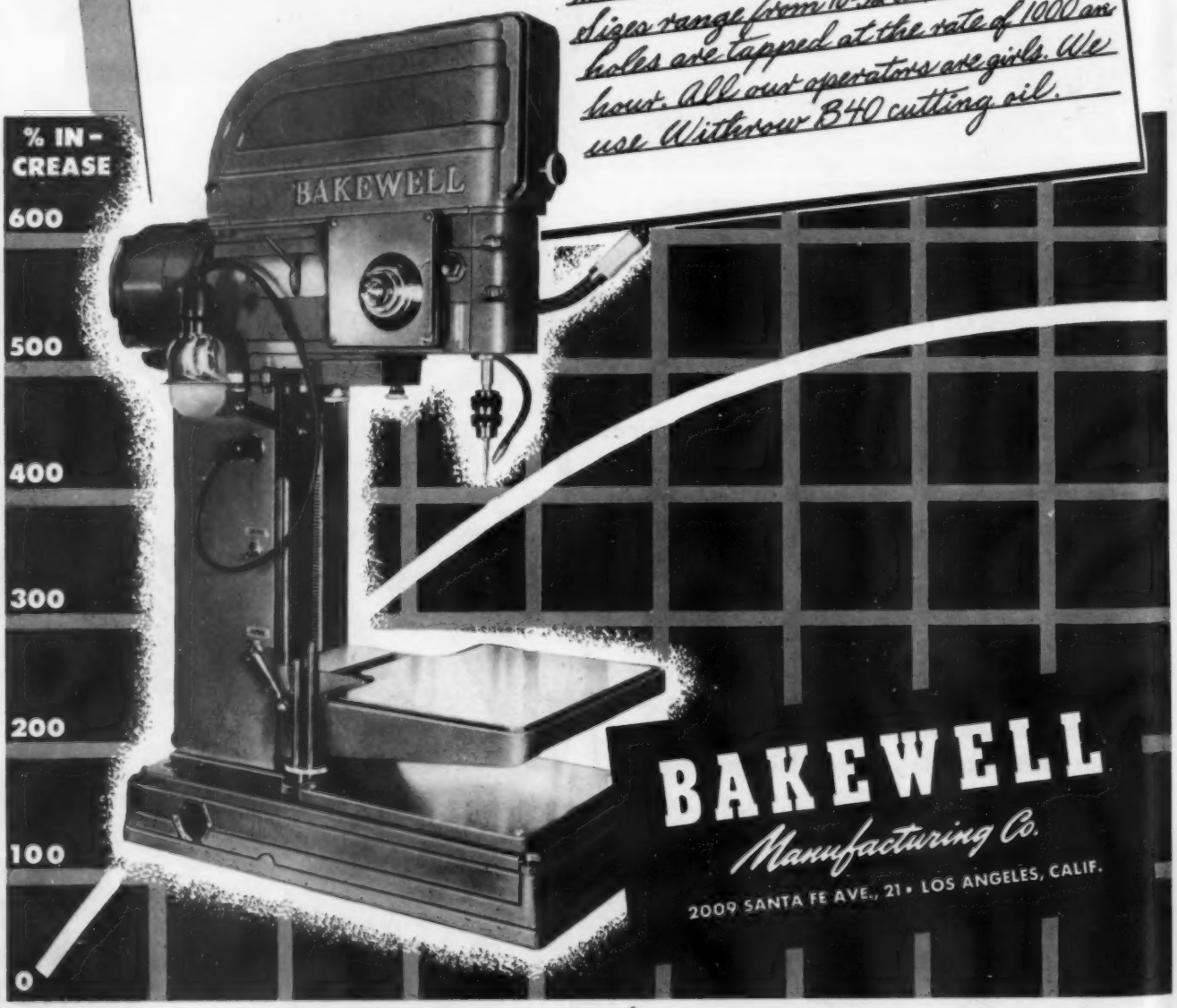
ARMY E NAVY

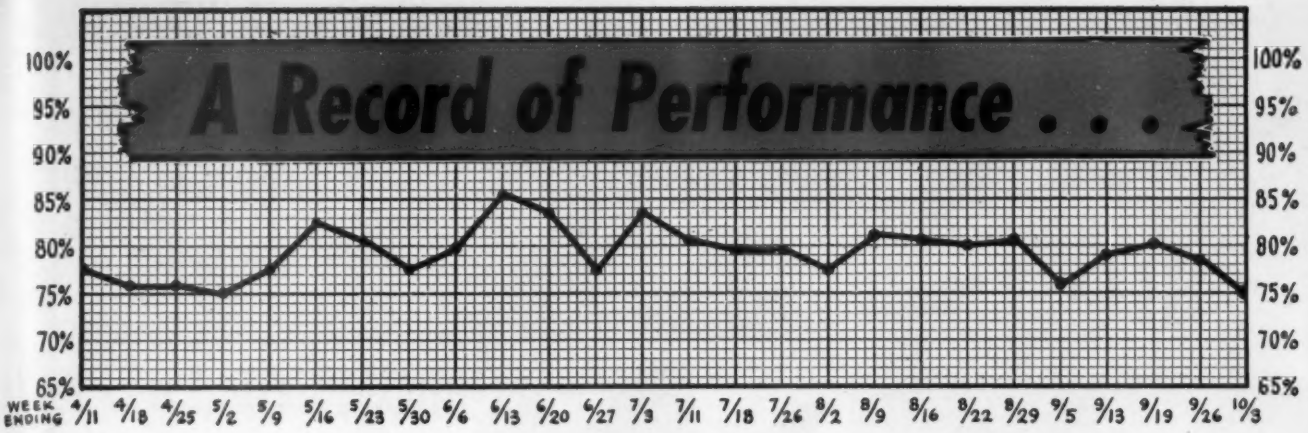
Why CLARY MULTIPLIER INCREASED TAPPING PRODUCTION *540%*

CASE HISTORY No. 4

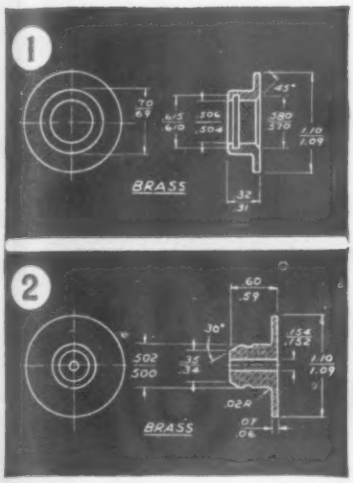
The fourth of a series of actual case histories showing how Bakewell Precision Tapping Machines save invaluable time and critical materials in war production.

FIRM: Clary Multiplier Corporation, Los Angeles
TAPPING MACHINE: Bakewell bench model No. 0
PIECE TAPPED: Anchor Nut
MATERIAL: X1112 steel
CLASS FIT: 3
SIZE OF TAP: 10-32
NO. HOLES TAPPED PER HOUR WITH BAKEWELL: 2000
NO. HOLES TAPPED PER HOUR BEFORE USING BAKEWELL: 312
REMARKS: We have a battery of 3 Bakewell No. 0 models, all tapping 24 hours a day. Sizes range from 10-32 to ¼-28; the latter holes are tapped at the rate of 1000 an hour. All our operators are girls. We use Witterow B40 cutting oil.





In Screw Machine Operations



● Here's a war production story that is typical of America's will to win. It's a story that deals with a factual record of screw machine operations from the files of a company recognized for its efficiency and excellence in production methods—the Briggs & Stratton Corporation.

Case History of Greenlee 6-Spindle Automatics

The graph above traces the average productive time of 10 Greenlee 6-Spindle Automatics over a 26 week period, while operating on a round-the-clock schedule — 3 shifts — 24 hours per day — 7 days per week. It takes into account all down-time charged against each machine's performance, regardless of cause. It includes all time losses due to power failures or tool breakage, as well as for ordinary time losses in making set-ups, re-tooling, etc. It includes major change-overs in set-ups on 4 machines during the period — the remaining machines operated without change-overs in set-ups. Duplicate tools were kept in readiness — changes were made in short order, and the high rate of production efficiency maintained — an over-all average of 79.01%. So we salute Briggs & Stratton Screw Machine division who have and are still efficiently producing a full share in America's production drive to Victory!

PRODUCTION DATA

Two of the parts produced on the Greenlees at the Briggs & Stratton plant are shown above. The sequence of operations are outlined below:

1 Part No. 453763 — Vane Holder Cap

Operations

1st Pos: Rough-form and spot for drill.
2nd Pos: Finish-form and drill hole.
3rd Pos: Recess.
4th Pos: Face front-end flat using Greenlee releasing holder; step-drill hole.
5th Pos: Ream (Step Reamer).
6th Pos: Cut-off.

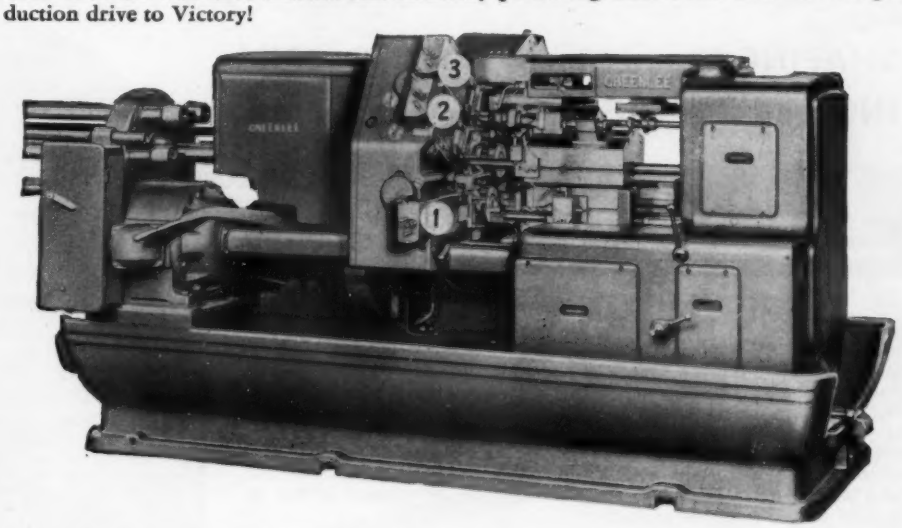
Production Rate — 600 Per Hour at 1400 R. P. M.

2 Part No. 453759 — Vane Holder

Operations

1st Pos: Rough-form ¼" depth, also large diameter; spot for drill.
2nd Pos: Finish-form small diameter; drill, using drill speeder.
3rd Pos: Finish-form large diameter.
4th Pos: Face front, using Greenlee releasing holder.
5th Pos: Shave and ream hole.
6th Pos: Cut-off.

Production Rate — 514 Per Hour at 1400 R. P. M.



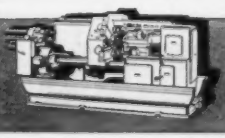
When operating with semiskilled or untrained help, you'll find the easy adjustments and open tooling area of Greenlee 6-Spindle Automatics of vital aid in overcoming operator problems. There are also features that contribute to a high rate of efficiency on short run jobs. *Write for full information*—

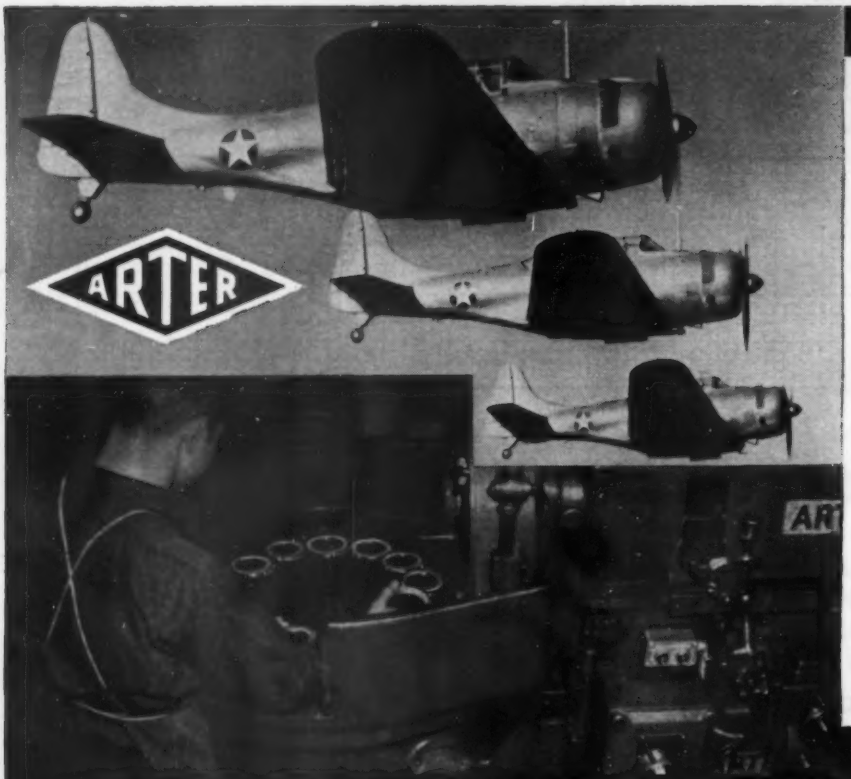
GREENLEE BROS. & CO., 1722 Mason Avenue, Rockford, Illinois

A Star Has Been Added

A star, awarded August 21, 1943, has been added to Greenlee's Army-Navy "E" Flag.

BUILDERS OF THE FAMOUS MULTI-STATION AUTOMATIC TRANSFER MACHINE FOR MASS PRODUCTION OF AIRCRAFT CYLINDER HEADS

GREENLEE  *Automatic Screw Machines*



Several hundred ARTER ROTARY GRINDING MACHINES are employed by Wright Aeronautical Corporation in the tremendous production of aircraft for war and victory. To build the necessary horsepower into an aircraft engine requires machinery that produces the highest degree of perfection.

Photo—Douglas SBD "Dauntless" U.S. Navy bomber—powered by a Cyclone 9 of 1000 horsepower, manufactured by the Wright Aeronautical Corporation, Paterson, N. J.

ARTER GRINDING MACHINE COMPANY

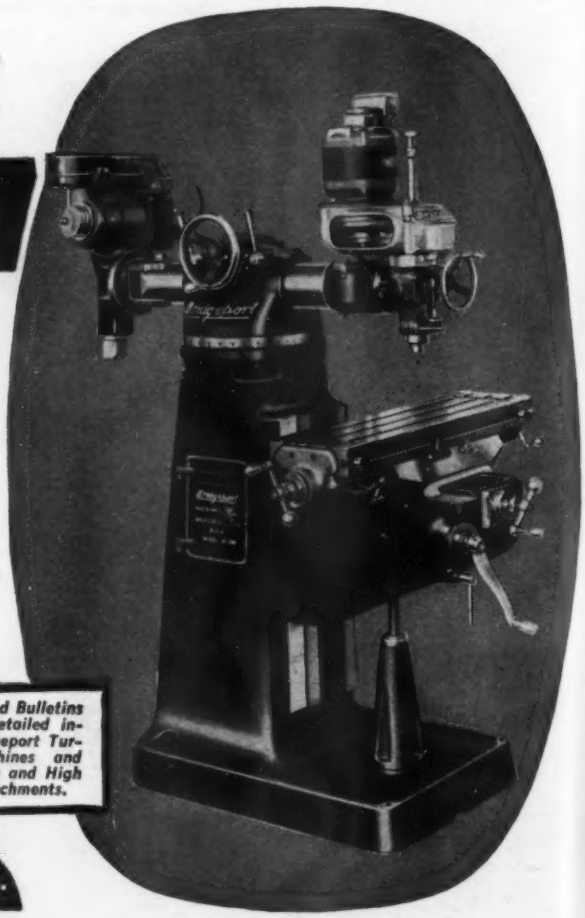
WORCESTER, MASSACHUSETTS • U. S. A.

SHAPING *in addition to* MILLING, DRILLING *and* BORING . . . *now available on*

Bridgeport

TURRET MILLING MACHINES

The new Bridgeport Shaping Attachment adds an extra feature which makes these machines capable of almost unlimited utility. Design is such that this new attachment can be mounted not only on existing Bridgeport Turret Milling Machines (shown here on back end of overarm) but also on other types of milling machines and special production equipment. Shaping operations can be performed at all angles making this attachment fast, and practical on die and mold work of all kinds as well as for intricate slotting on production jobs. The Bridgeport Shaping Attachment is now in production and is available promptly.



Investigate This Versatile Machine

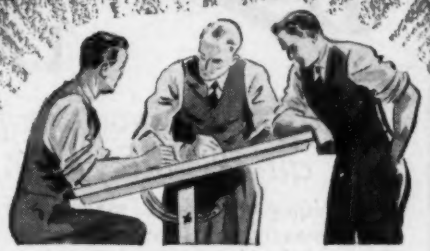
The Bridgeport Turret Milling Machine with High Speed Milling Attachment handles milling, drilling and boring at all angles with maximum ease and convenience. It can be depended on for accuracy and speed on a wide range of work. It is sturdy and powerful—a precision machine for production demands.
Features of the machine include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials.

Bridgeport High Speed Milling Attachments are available as separate units (¼ HP and ½ HP) for use on other types of milling machines and production equipment. They are extensively used in all branches of the metal working industry and making a valuable contribution to war production.

Write for Illustrated Bulletins giving complete detailed information on Bridgeport Turret Milling Machines and Bridgeport Shaping and High Speed Milling Attachments.

THE BRIDGEPORT MACHINES, INC., *Bridgeport, Conn.*

How to Get the Most Economical Solution to Your Milling Production Requirements....



SUNDSTRAND ENGINEERS Can Solve It with One of these 3 Practical Answers

1 Standard Rigidmils with Fixtures and Tooling to Suit Your Work

When possible, milling production problems are solved most economically by standard Rigidmils using standard attachments or simple fixtures and tools to suit the work. Next most economical solution is...

(Left) Standard Rigidmil with simple hand clamp fixture for continuous milling valve tappet guides.

2 Standard Rigidmils with Special Heads and Tooling

All Standard Sundstrand Rigidmils are designed to accommodate the application of a wide variety of special heads and tooling. Consequently, an unlimited number of milling production problems can be solved with special arrangements of standard Rigidmils. When not economical to do this, our engineers can design...

(Left) No. 1 Rigidmil with special 2-spindle head and automatic index base for milling clutch teeth.

3 Entirely Special Machines

These machines are designed only when the required production cannot be obtained most economically by either of the foregoing methods.

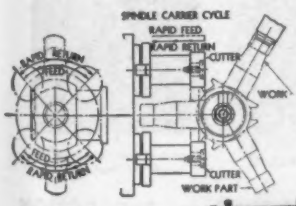
(Left) Automatic Milling Machine for milling oil groove in 12 different sizes of bearings—both plain and flange type.

Planetary Milling Flanges

Part—Propeller Spider.

Operation—Planetary milling flanges on each of three arms.

Machine—Sundstrand two-spindle planetary milling machine mills two circular surfaces around each arm of the Hub Spider. Surfaces were formerly milled one at a time on a single spindle machine. Machine has manually indexing fixture which permits machining all surfaces without relocating the part.



Get these Free Booklets or Call in a Sundstrand Production Engineer

These free booklets cover the entire range of Sundstrand standard Milling Machines. Write for them today. Ask for Bulletins 120. If your problem cannot be met with these standard millers, our engineers will be glad to assist in the designing of a special machine to do the job economically. Call on them without obligation.

SUNDSTRAND MACHINE TOOL CO. ROCKFORD ILLINOIS U.S.A.

ARMY NAVY

SUNDSTRAND MACHINE TOOL CO.

Rigidmils • Fluid-Screw Rigidmils • Automatic Lathes • Hydraulic Equipment • Drilling and Centering Machines • Special Milling and Turning Machines

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"Blount" MODEL B-2 LATHE

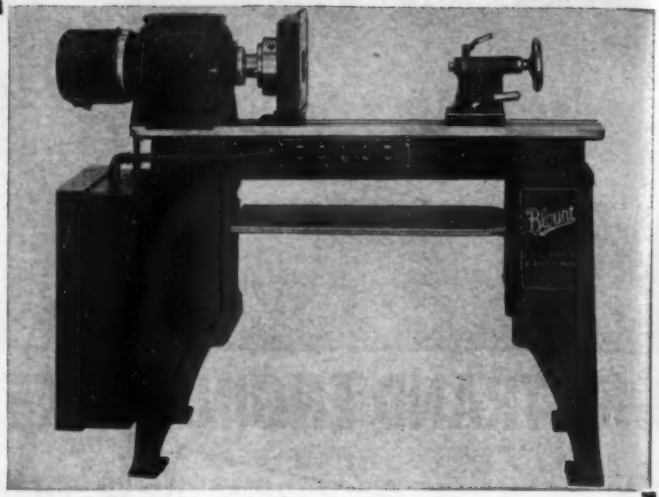
. . . offering modern features for quick, easy control . . .

This highly developed machine provides every convenience which modern design can offer to make it highly productive with a minimum of effort on the part of the operator.

A Ball-Bearing Motor Type Headstock is used and is equipped with the very latest type selective speed pushbutton control, including magnetic contact panel. An automatic electric solenoid brake is provided for quick stopping and includes also a manual spindle release.

Lathes of similar type are generally furnished with four-speed drum controller, mounted on inside of leg (outside optional) also with reversing switch, and may include solenoid brake as Lathe B-2 together with chuck guard.

Standard equipment of Lathe Model B-2 includes "chuck guard" as well as six adapter plates or slides having various hole diameters to suit conditions.



CONDENSED SPECIFICATIONS

Swing—12", Bed—4'
4 Speeds—600-1200-1800-3600 R.P.M.
(also furnished for 300-600-900-1800 R.P.M.)
H.P.—½

Also furnished as follows:
Swing—16" and 18", Bed Lengths—optional
4 speeds—300-450-600-900 R.P.M.
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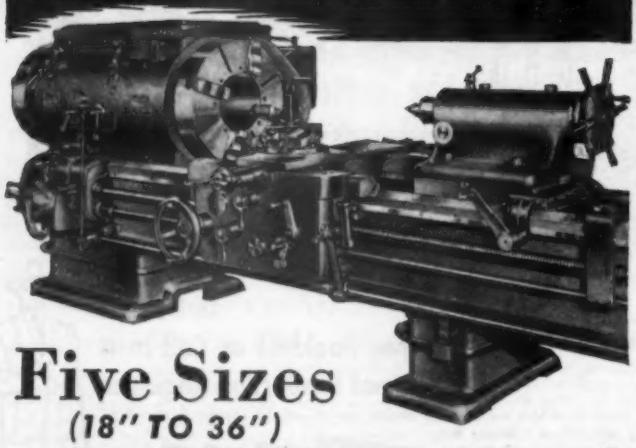
Complete details available promptly on request

J. G. BLOUNT COMPANY *Everett, Mass., U.S.A.*

HYDRATROL LATHES

Large Hollow Spindle Type



Five Sizes
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Provide Wide Range of Usefulness and Efficiency!

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ROTOREX UNIVERSAL GRINDER

Cylindrical grinding Attachment

Internal grinding Attachment

Sharpening a Helical Cutter

FOR SHARPENING and PRODUCTION

PRECISION BUILT to perform two jobs—Production work such as cylindrical and internal grinding and sharpening of all kinds of tools.

The keynote of the Rotorex is simplicity, accuracy and flexibility.

Compact and simple in design with a minimum number of working parts in conjunction with conveniently located controls.

Precision built for sustained accuracy because of good workmanship.

The variety of work it handles is attained by a wide range of attachments for faster set-ups. Selective speed range from 3000 to 6000 RPM.

DOUGLAS MACHINERY CO., Inc.
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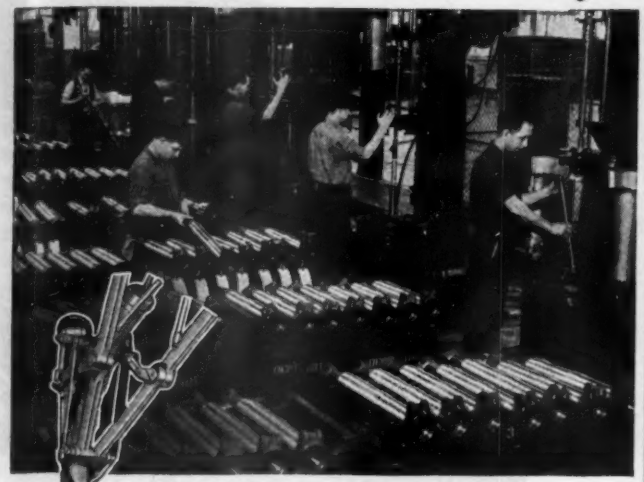
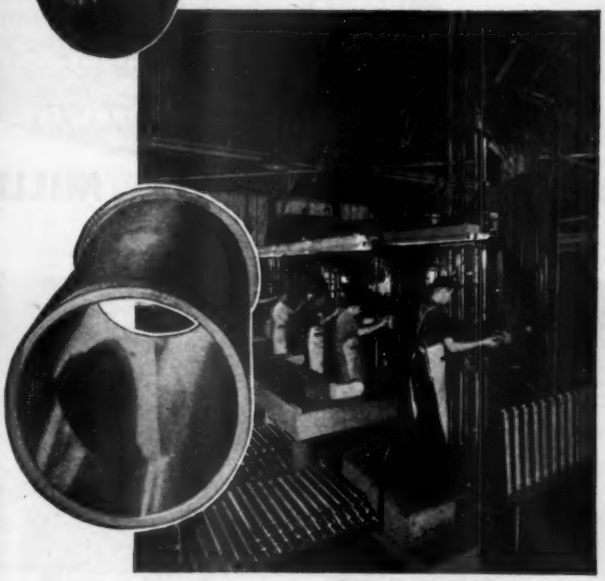
How Honing Provides "Aircraft



(Above) A battery of BARNESDRIL Honing Machines used for honing aircraft landing gear cylinders. Honed diameter is 3¼" x approximately 18" in length.

(Left) A typical retracting type landing gear used on one of our Navy's fighting planes.



(Above, left) A honed landing gear cylinder showing resulting mirror finish.

(Above) BARNESDRIL Honers used for finishing oleo tubes and landing gear hydraulic cylinders.

You can get complete facts about honing and our entire line of equipment in this free, valuable booklet. Write for Bulletin A-121.

Barnes Drill Co.

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Extensive research projects are also carried on at various universities and professional research laboratories.

Group opinion is built into Defiance Machines. It is our policy to carefully study field requirements and the machine is developed not just by one of our engineers but by our engineering department in cooperation with our sales engineers, plant superintendent and master mechanic.

By giving close attention to the customers' problems and the problems of manufacturing Defiance equipment, we are able to give the maximum in quality and performance at reasonable cost.

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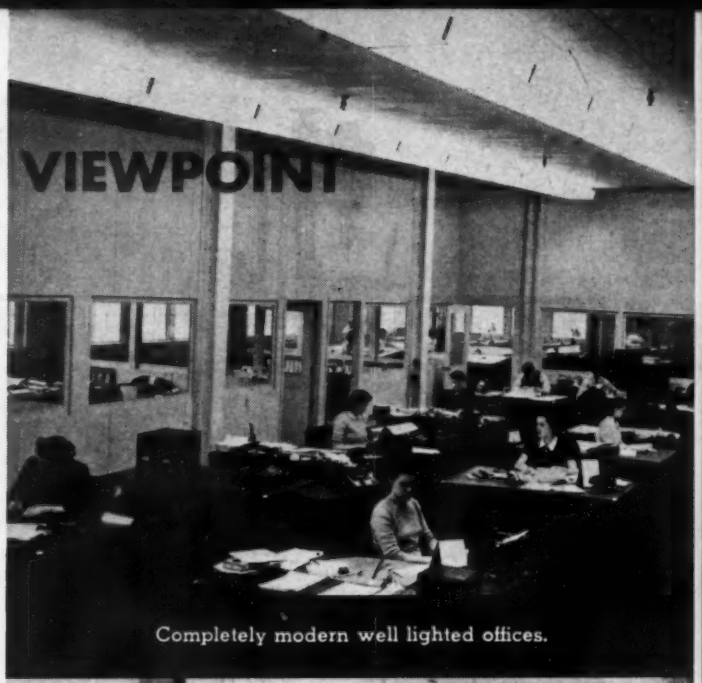
Horizontal **BORING .. MILLING**

Defiance is on the B & O. Visitors preferring N. Y. Central will be met at Bryan or Pennsylvania at Lima or Ft. Wayne.

One block off the main street the plant is on Route 24, main road connecting Toledo and Ft. Wayne.

Reception room contains interesting exhibits.

WITH THE SHOP MAN'S VIEWPOINT



Completely modern well lighted offices.

Portion of main drafting room.

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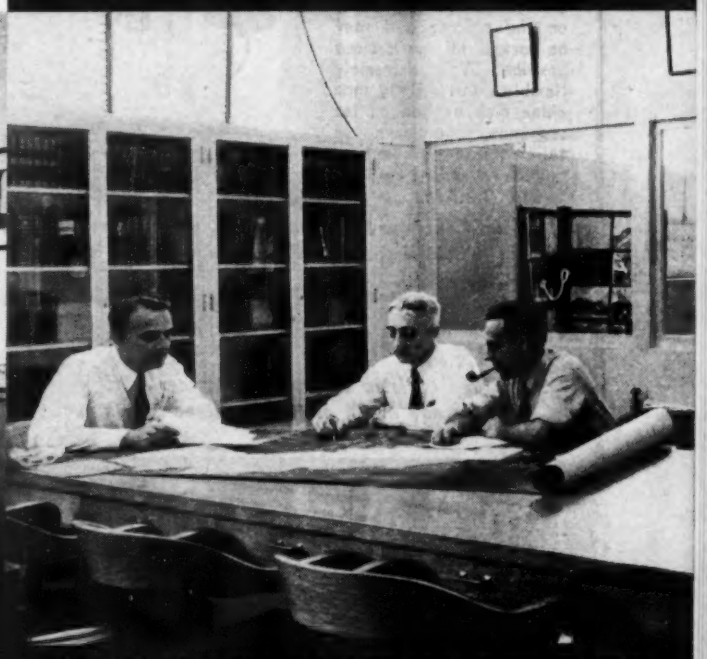
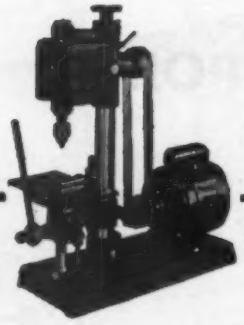
Accurate scale models of Defiance equipment in Sales Engineering Display room.



New 500 volume technical library and engineering conference room.



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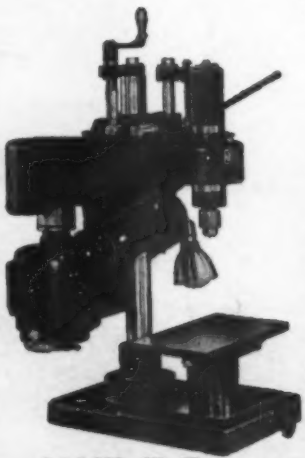
A high production sturdy little machine particularly suited to precision tapping of light work—instruments, cameras, watches, clocks and the like. Easy to operate—can be attached to any light socket.

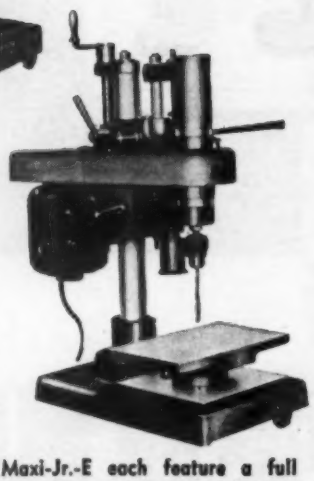


"VARIMATIC"

Built with instrument precision allows instantaneous variable speed adjustment in two ranges. Low range 840 — 270 R.P.M. High range 2900—9300 R.P.M. Drill capacity .004" to 5/16".

MAXI-JR-E

Designed and built for accurately drilling small holes .004" to .250" diameter. It consists of a self contained drilling unit which swings radially on the column and may be locked in any desired position. This extremely flexible small drilling machine may be ganged for sequence operations or to increase production. Spindle speeds from 750 to 21,000 R.P.M.



The "Varimatic" and the Maxi-Jr.-E each feature a full floating spindle of special design which eliminates radial belt pull on the spindle.

•

Write for full particulars on any or all of the machines shown.

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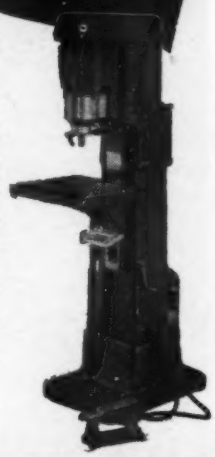
IT'S IN THE *Air!*

AIR CONTROL is the Secret of precision tapping The Haskins Way

Accuracy—to a class 4 fit when necessary—is constant—each part is tapped exactly like every other, independent of operator efficiency. AIR regulates the complete tapping cycle—not only the down stroke, but its control is so sensitive that the tap is allowed, in effect, to float out of the part. Tap life is longer—tap breakage practically eliminated. Send today for your copy of catalog on Tapping —The Haskins Way. R. G. Haskins Co., 2761 W. Flournoy St., Chicago, Illinois.



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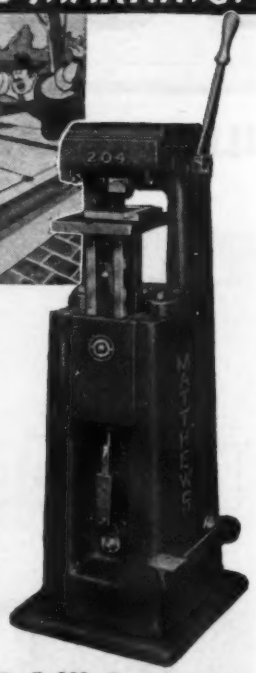
DEEP... LEGIBLE MARKING!

... with Matthews New No. 204

MARKING MACHINE



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A range of parts up to 6" in dia. or thickness . . . legibly marked with this NEW General Purpose Marking Machine Round parts marked with flat dies . . . flat parts marked with roller dies.

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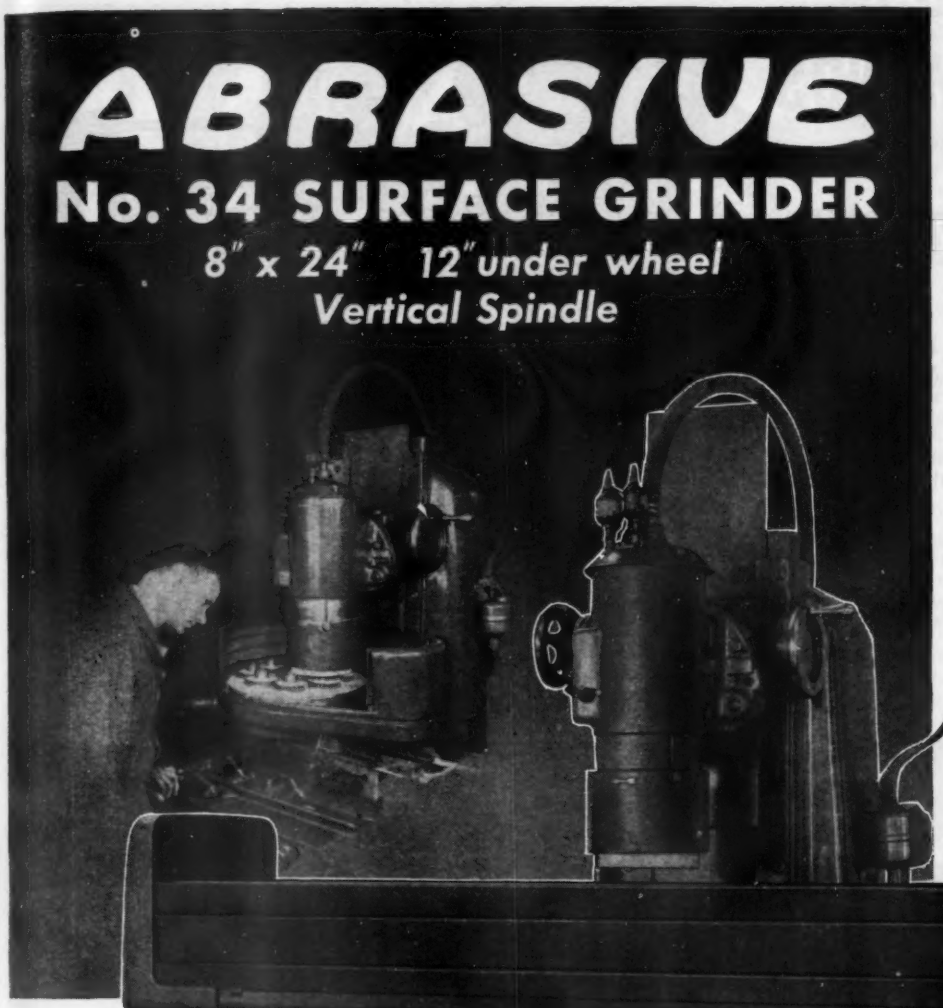
8" x 24" 12" under wheel
Vertical Spindle



SPECIAL EQUIPMENT
(furnished at extra cost)

Special Cortland type Segmental Wheel Chuck

In many cases —

Reduces wheel wear

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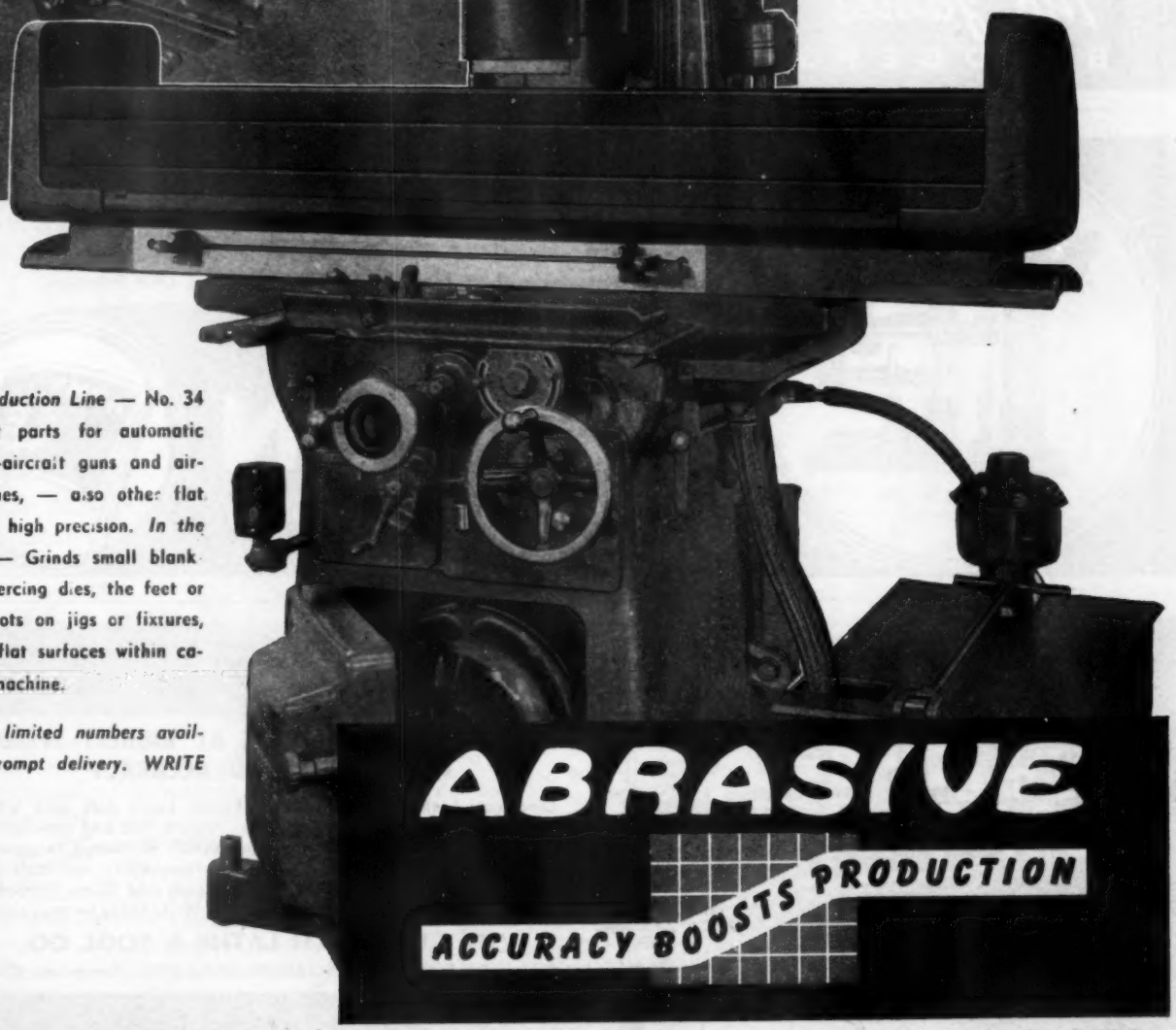
Lessens tendency to overheat or "burn"

Increases production of small parts

Rotary Grinding Attachment
(See inset)



On the Production Line — No. 34 grinds flat parts for automatic rifles, anti-aircraft guns and aircraft engines, — also other flat surfaces of high precision. *In the Toolroom* — Grinds small blanking and piercing dies, the feet or locating spots on jigs or fixtures, and other flat surfaces within capacity of machine.

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DEFENSE DEMANDS
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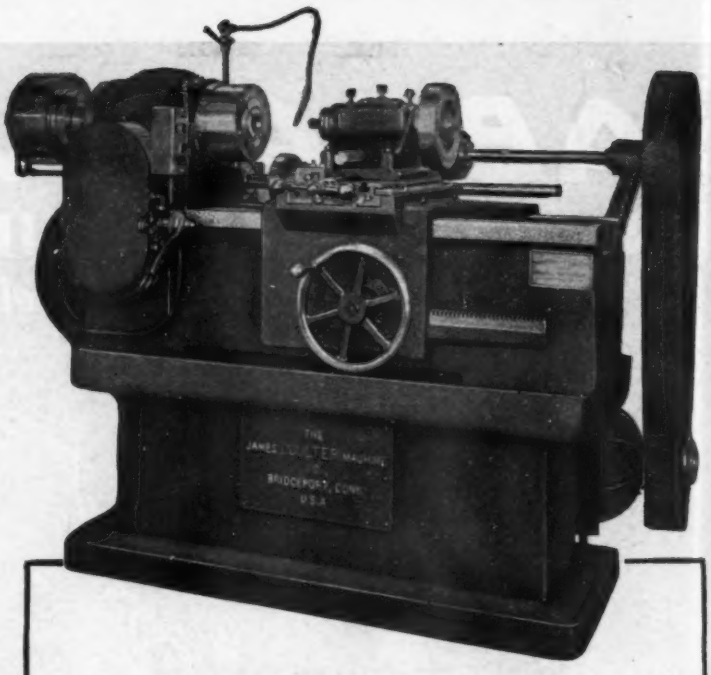
EXTERNAL and INTERNAL THREADS



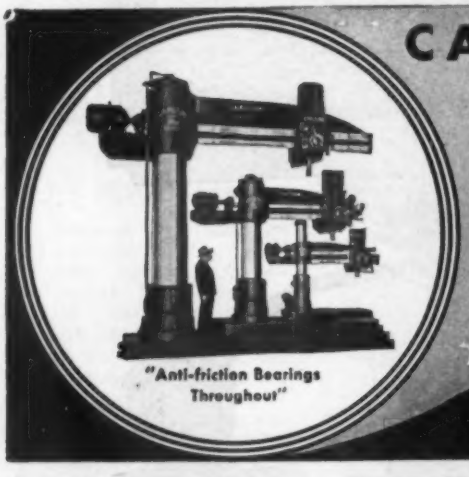
The Coulter Type "H" Hob Thread Miller—modern in every detail of design and construction—handles high speed, accurate production of right or left hand threads. Any parts that can be held in ordinary chucks, air operated chucks, air operated collet chuck or special face plate fixture can be threaded on this machine.

Work holding spindle and cutter spindle are driven by individual motors through worm and gears. Speed changes to work spindle are accomplished by pick-off gears; cutter spindle speeds are controlled by variable motor sheave. All high speed shafts turn in anti-friction bearings.

Maximum external thread, 7"; minimum hole depends on smallest hob practical.

Send for Descriptive Bulletin giving full information.

The James COULTER *Machine Co.*
BRIDGEPORT • CONNECTICUT • U.S.A.



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FEATURES— 1. Low Hung Drive to the Spindle. 2. All Power Driven Parts Running in Oil. 3. Quiet Running at all speeds. 4. Concentrated and Convenient controls. 5. Constructed on Unit Principal.

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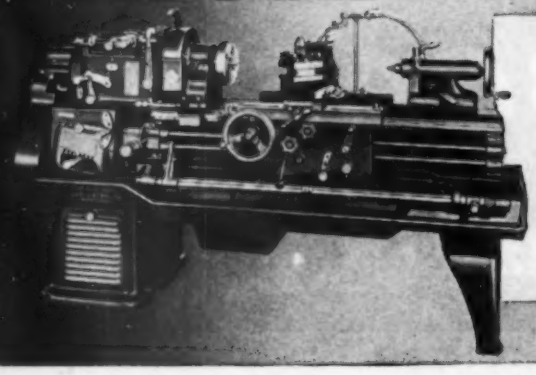
CINCINNATI LATHES



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Cincinnati Lathes are produced to handle heavy duty work with ease and precision. They are powerful, rugged, fast and convenient with every detail of design and construction developed to assure long-lived accuracy under full capacity operation. Available in sizes from 14" to 30", with 12 or 24 speeds and 32 to 96 feeds. Our latest catalog gives complete details. Write today for your copy.

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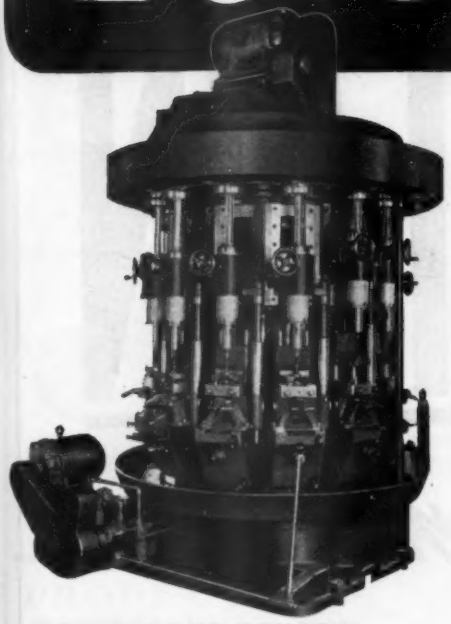

★ Here are three unusual machines which speak for The Sommer and Adams Company's 25-year acquaintance with the field of special machines. They were created in their entirety and built by our staff. Their remarkable production records are not to be publicized at this time. However, those records are sufficiently convincing to justify *your* confidence in the Sommer and Adams organization as a source of supply. Also, they should earn *your* inquiries for the design and construction of special-purpose equipment.

CONTINUOUS DRILLING WITH 12 SPINDLES

Altogether in keeping with the increasing tempo of today is this 12-spindle continuous rotary drilling machine which makes possible a huge increase in the production of automotive, airplane and other parts.

8-STATION CONTINUOUS MILLING MACHINE

Another example of Sommer & Adams design: an 8-station mechanically operated continuous milling machine for milling keyways in axle shafts. Pick-off gears in index and spindle gear boxes change speed and feed of cutter spindles and turret index. Cutter spindles are worm-and-worm driven. All in all, a machine designed and built to answer today's insistent call for speed with accuracy.

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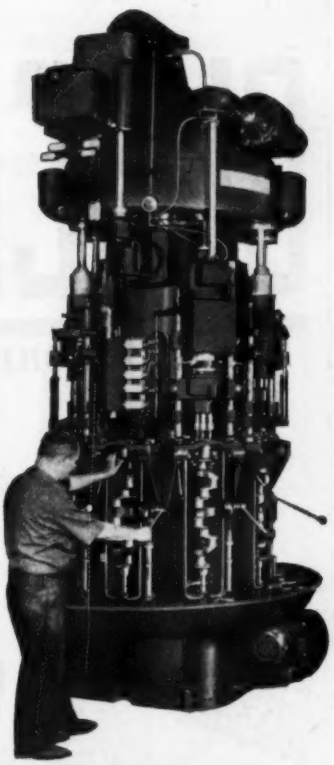

The Sommer & Adams Co. places at your command a 25-year acquaintance with the intricacies of special machine design and construction.

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Custom-Built EQUIPMENT FOR MANY PURPOSES

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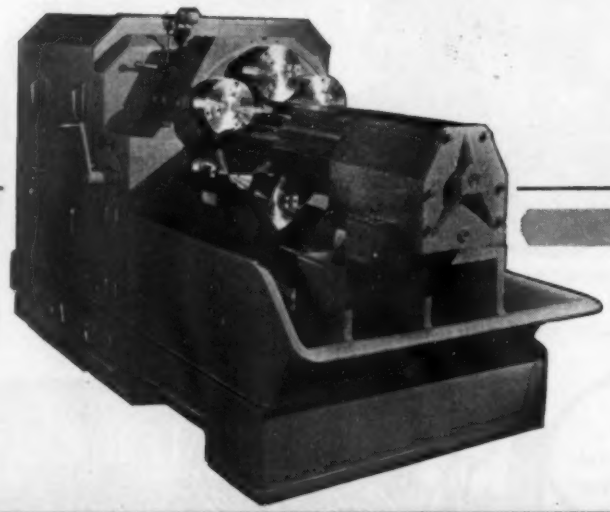

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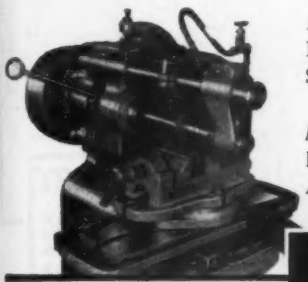

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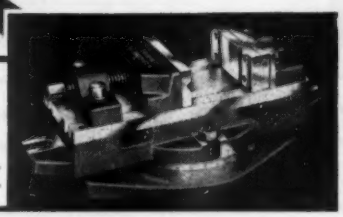

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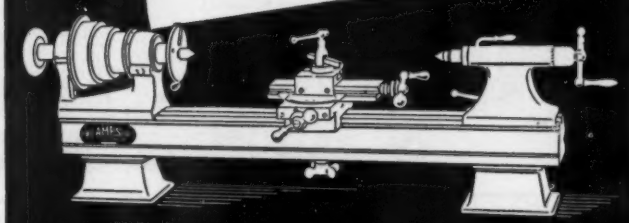

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Features include: a direct-reading micrometer depth gauge that prevents pencil figuring errors; a choice of eight spindle speeds—one for every need; counterbalanced quill to remove backlash; rugged, compact construction for a minimum of floor space (18½" x 20").

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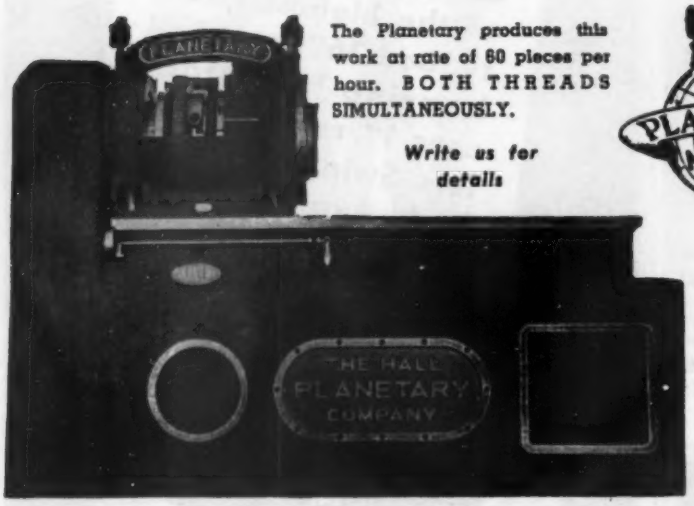

The Planetary produces this work at rate of 60 pieces per hour. BOTH THREADS SIMULTANEOUSLY.

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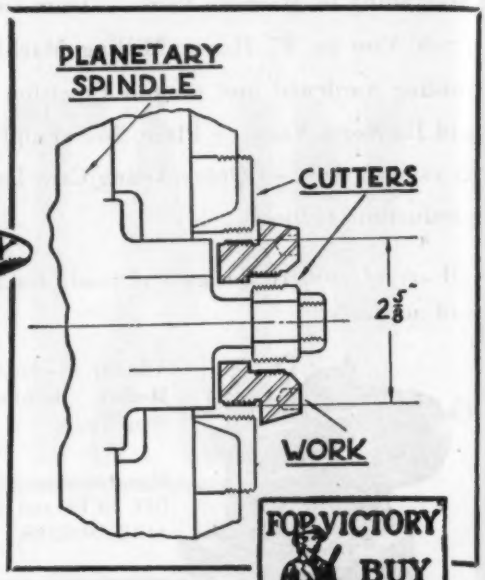

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Complete Machine

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CHAMFER — FLUTES — SPIRAL POINTS OF TAPS

— other tools requiring eccentric chamfer relief — straight or angular flute sharpening.

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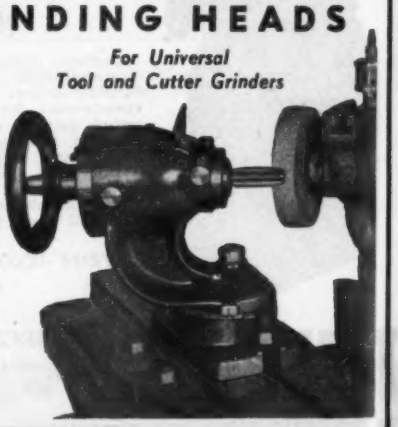
Heads used on tool and cutter grinders efficiently and economically. Complete Tap Grinder recommended for large quantities.

Grinder Circular AG — Head Circular AH

For Universal Tool and Cutter Grinders



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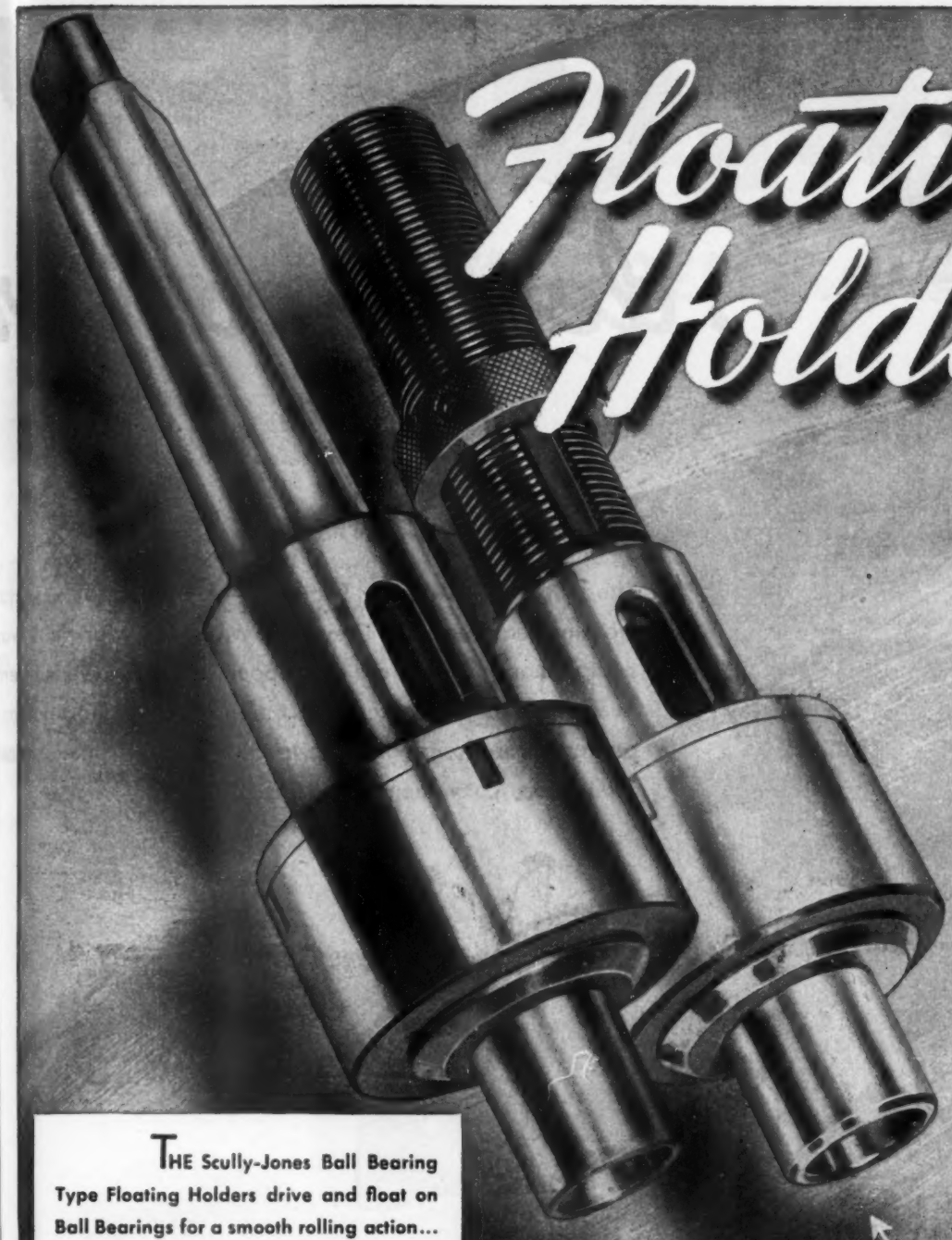
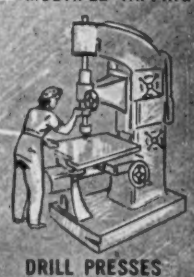


MULTIPLE TAPPING



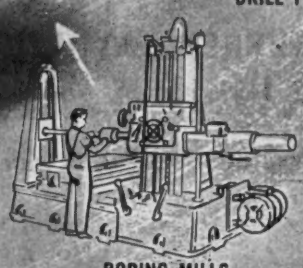
DRILL PRESSES

THE Scully-Jones Ball Bearing Type Floating Holders drive and float on Ball Bearings for a smooth rolling action... compensating for misalignment between machine spindle and work.

Eliminate scrap from Bell-Mouthed or oversize holes when reaming or precision tapping on AUTOMATIC SCREW MACHINES, LATHES, TURRET LATHES, DRILL PRESSES or MULTIMATIC MACHINES.

Optional Straight, Threaded or Tapered Shanks... Collets with Straight or Tapered holes.

TURRET LATHES OR SCREW MACHINES



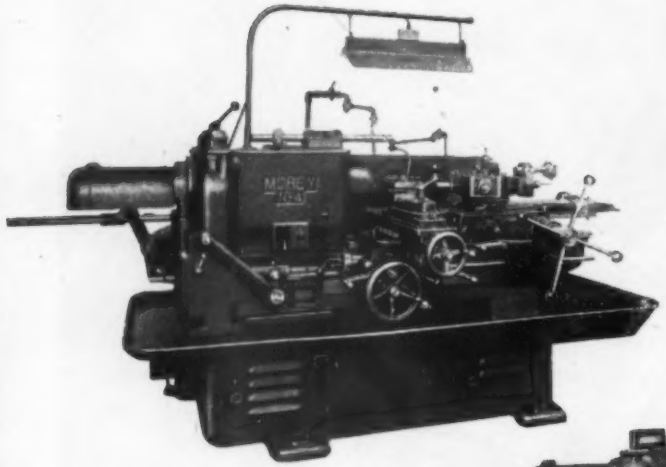
BORING MILLS

Scully-Jones AND COMPANY

1901 SOUTH ROCKWELL STREET ★ CHICAGO, U. S. A.

MOREY

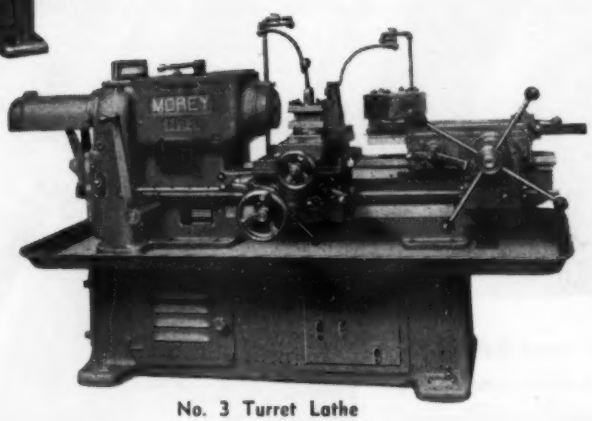
...designed for



No. 4 Turret Lathe

FINGER TIP CONTROL

These MOREY Machine Tools are serving today's metal working requirements. They are a *MUST* for your post-war competition. They were developed to meet the urgent needs of war production and embody every modern improvement in design and construction to assure the utmost in stamina, convenience and precision.



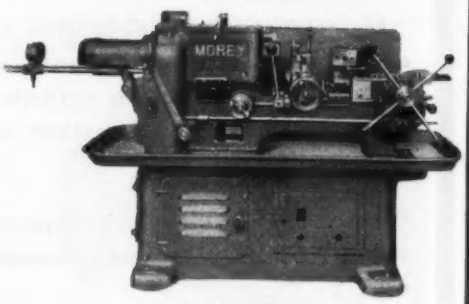
No. 3 Turret Lathe

MOREY TURRET LATHES
Plain and Universal

These machines are handling a wide variety of jobs in war production.

	No. 2G	No. 3	No. 4
Automatic Chuck Capacity	1" round	1½" round	2" round
Turning Length	6½"	10"	12"

Ask for Circular 742



No. 2G Turret Lathe

MOREY MACHINERY CO., Inc., 410

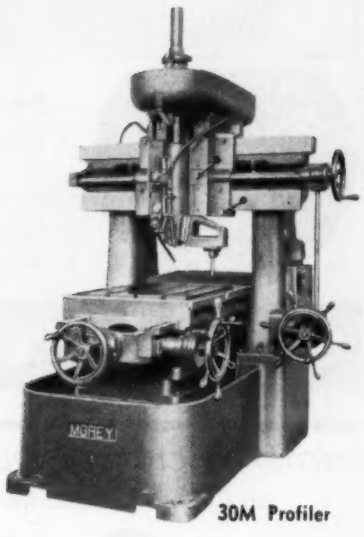
MACHINE TOOLS

TOMORROW'S SPEEDS *and* FEEDS

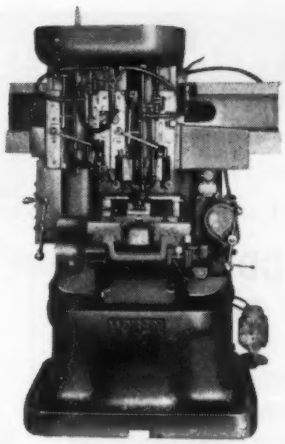
MOREY No. 12M and No. 30M
VERTICAL PROFILERS and
MILLING MACHINES
In Single and Double Spindle Types

Make fast work of every job assigned to them.

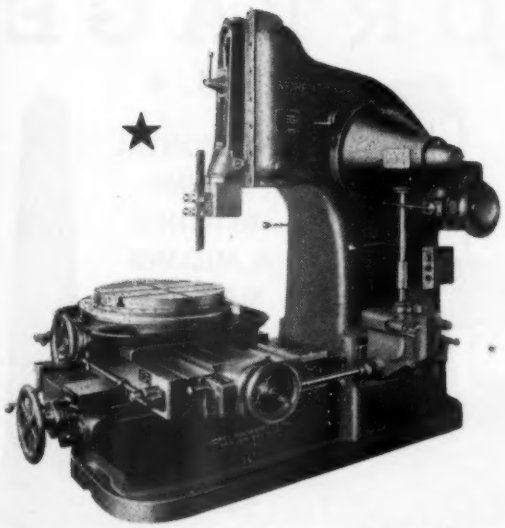
Ask for Circular 680A



30M Profiler



12M Profiler



Morey Vertical Shapers in 8", 12", and 14" Strokes

MOREY VERTICAL SHAPERS
In 8", 12" and 14" Strokes

Provide the right cutting stroke speeds for machining the maximum number of given pieces in minimum time and conserve operators' time and effort.

Ask for Circular 726A

A Brochure describing our complete line is available. Ask for it.

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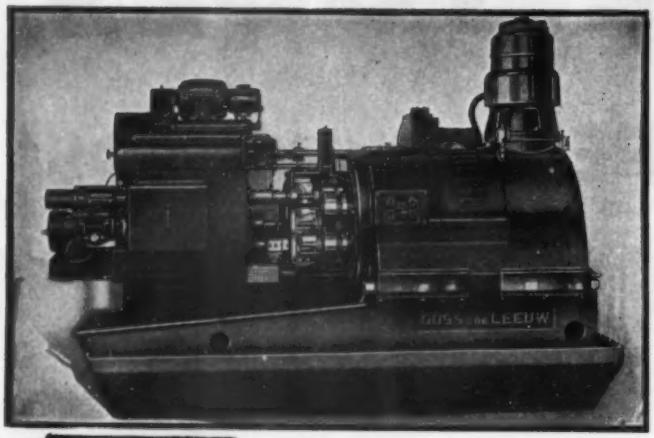
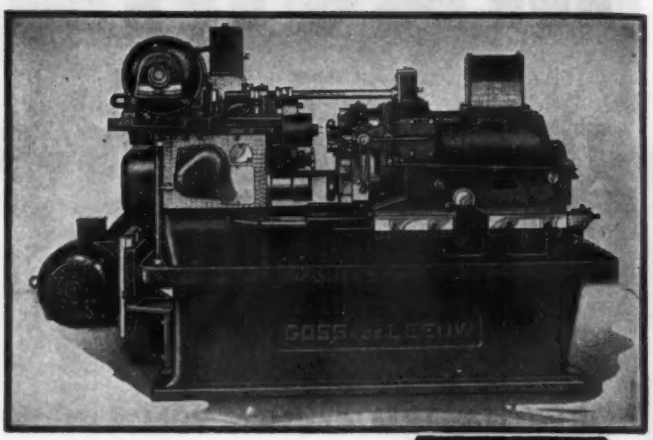
GOSS & DE LEEUW *Multiple Spindle* CHUCKING MACHINES





WORK ROTATING TYPE
5 Spindles
6 Spindles
8 Spindles

Features include:

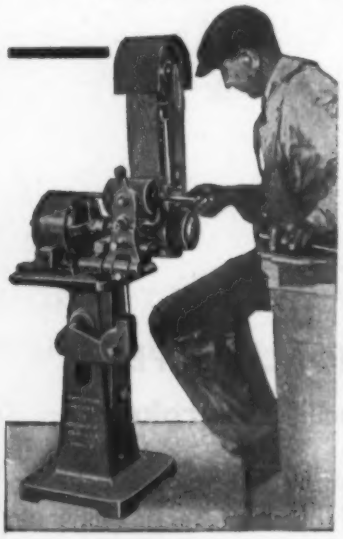
Lead Screw Threading on both types—Preloaded Anti Friction Spindle Bearings—Hardened Ways—Oversize Spindles—Gears of Chrome-nickel steel, carefully heat-treated.

Write for copy of descriptive catalog giving complete, detailed specifications.

TOOL ROTATING TYPE
4 Spindles
5 Chucking Positions

GOSS & DE LEEUW MACHINE CO., NEW BRITAIN, CONN.

SPEED PRODUCTION by REPLACING HAND LABOR on Cylindrical and flat work with the



"PRODUCTION"
Type S
Centerless Polishing and Finishing Machine

Features

Feed mechanism easily swung out of way or removed.
Adjustable gage for bevels.
Belt provided with tracking device.
Automatic belt take-up.
Ball bearing equipped.
Direct motor drive.

Quick change from vertical to horizontal converts the type S from a centerless feed polishing machine to straight line finishing on flat or irregular work. It may be used in either position for any material that can be ground or polished such as metals, rubber, fibre, wood, etc.

This machine is ideal for replacing hand labor on such work as grinding welds of tubular airplane parts, lubricating frame parts and other cylindrical work.

High speed is assured on cylindrical work by the use of Centerless Feed Attachment which feeds work automatically without centering or chucking.

Write for illustrated literature giving complete details.

PRODUCTION MACHINE CO.
Manufacturers of Drilling Machines, Tool Grinders and Hand and Automatic Polishing and Grinding Machines.
GREENFIELD, MASS., U. S. A.

PORTAGE

NO. 4
HORIZONTAL BORING DRILLING & MILLING MACHINE

• Designed and built to meet the need for speed and accuracy demanded of today's production.

WRITE TODAY

for fully illustrated bulletin giving detailed description of the many features of this Horizontal Boring, Drilling and Milling Machine. No obligation.

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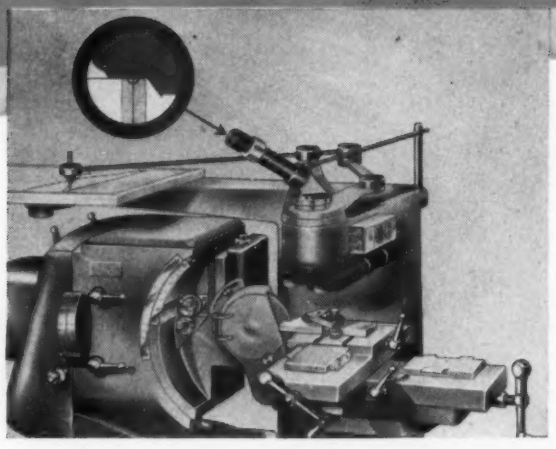
Work Holders · Toolholders · Machine Attachments · Punching Units, Dies · Air Cylinders · Coolant Systems and Lubricators · Production Counters and Cycle Timers · Cutters and Saws · Tool Materials · Dieheads and Taps · Marking Dies · Grinding Wheels and Dressers · Measuring Tools, Gages, Inspection Machines · Portable Power Tools · Hand Tools

AMERICAN MACHINIST'S 31ST ANNUAL REVIEW NUMBER

The SHEFFIELD MICRO-FORM GRINDER

With Pantograph and Microscope



Operator feeds grinding wheel toward point marked by cross hairs.

Typical flat and circular form tools possible to produce on Micro-Form Grinder.

Manufactured under Patent No. 1,811,940

FINISH GRINDS PROFILES DIRECT FROM DRAWING

No Templates Nor Masters

- Grinds both circular and flat form tools, templates, profile gages, cams, dies, etc. to accuracy of .0003".
- Especially suited for grinding cemented carbides and hardened steel.
- Grinding time, especially on intricate profiles, reduced as much as 50-75% compared to other methods.
- Not limited by regularity nor irregularity of work, nor by straight lines, angles or curves.
- Can be used reversely for making layouts from parts having unknown profiles, and for checking parts against layout drawings.

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THE SHEFFIELD CORPORATION

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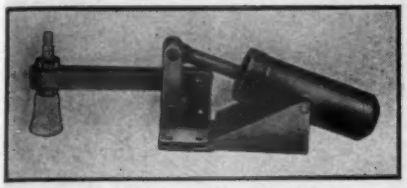
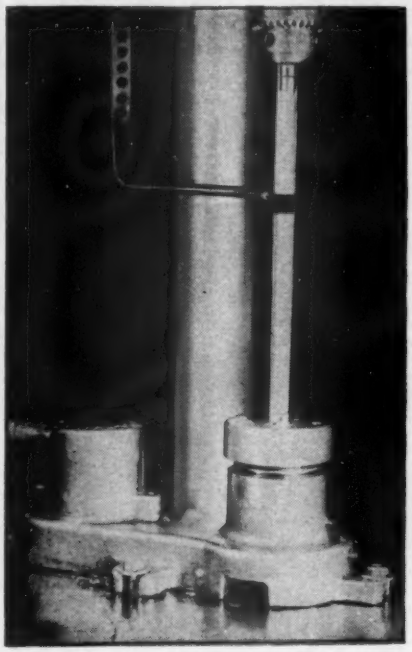
MACHINE TOOLS—GAGES—MEASURING INSTRUMENTS—CONTRACT SERVICES

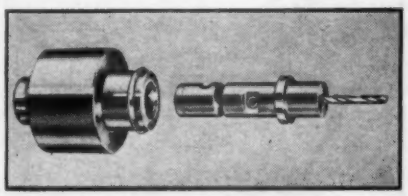
TOOLS and ACCESSORIES



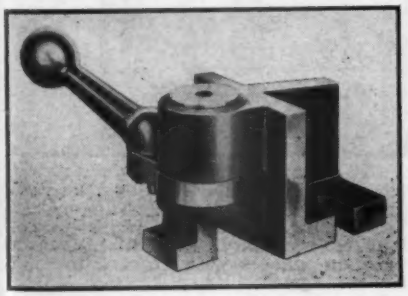
TOGGLE CLAMP—*Airop, Inc., Dearborn, Mich.* This device is intended for activating toggle clamps, and will hold down large parts or assemblies where clamps are required to encircle a job. Oct. 28, 1943, p. 134.

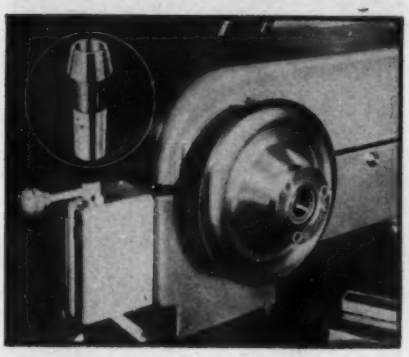


COLLET CHUCK — *Red-E-Air Chuck Co., 654 W. Lake St., Chicago 6, Ill.* This collet holding fixture, distributed by *Cleveland Airtool Co., 4616 Prospect Ave., Cleveland 3, Ohio,* takes work up to ⅞ in. diameter and is air-operated. Oct. 28, 1943, p. 134.

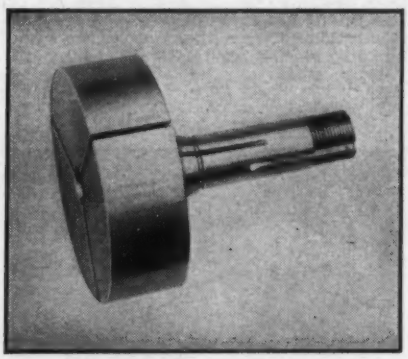


CHUCK—*R. M. Wright Co., Washington Square Bldg., Royal Oak, Mich.* Tools can be changed in 3 sec. while the Centrif-O-Matic high-speed drill chuck is operating. It handles drills 1/16 to 9/32 in. Sept. 16, 1943, p. 130.

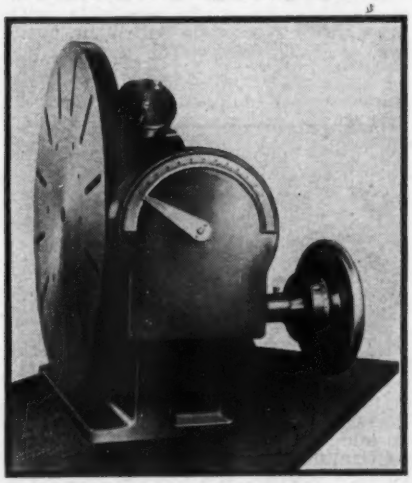




COLLET—*General Die-Stamping-Tool Co., 265 Canal St., New York, N. Y.* Small lathes of ½ in. capacity can handle collet work on stock up to ¾ in. with the Speedichuk and Bren collet, adaptable to any lathe with a 1½ in. by 8-thread spindle nose having a No. 3 Morse taper on the inside. July 8, 1943, p. 134.

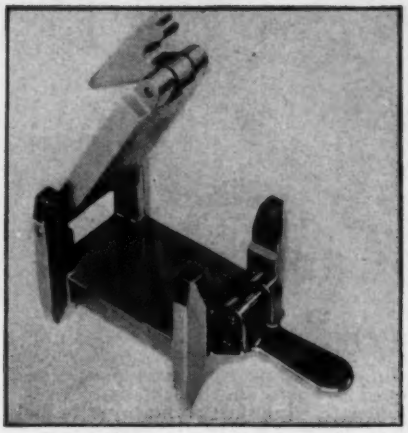


COLLET CHUCK—*Gilbert-Baker-Midlam Co., 38 N. Jefferson St., Dayton 2, Ohio.* Second operation lathe work can be handled with this universal chuck which accommodates diameters from ½ to 2¾ in. Oct. 28, 1943, p. 128.

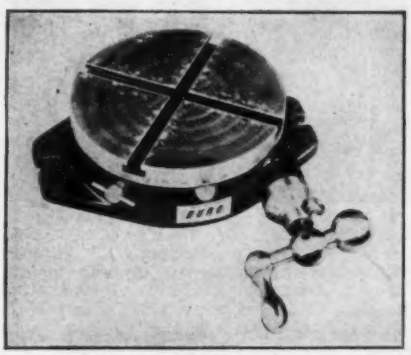


ROTARY TABLE—*Machine Products Corp., Detroit, Mich.* Large pieces for machining and measuring can be held on this 36-in. rotary table. Turning is by geared wheels, or, freely, by hand. July 22, 1943, p. 136.

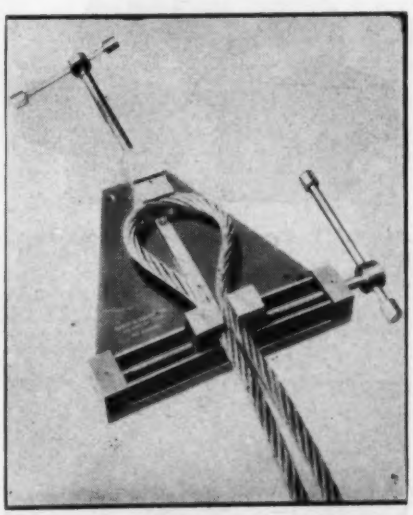
COLLET FIXTURE — *Wayne Pump Co., Fort Wayne 4, Ind.* This collet chucking fixture for holding stock in machine operation is furnished with undrilled jaws. It accommodates stock from 0 to ⅛ in. Nov. 11, 1943, p. 134.



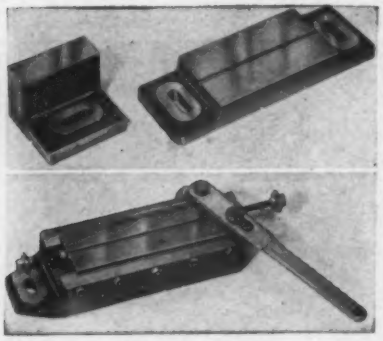
DRILL JIG—*Earl C. Parkhurst, 751 E. Stepney Pl., Inglewood, Calif.* The Parlec universal drill jig is equipped with a quick-locking device, which acts as a handle during drilling. Seven sizes are available from 1½x2 to 5x10 in. Apr. 15, 1943, p. 138.



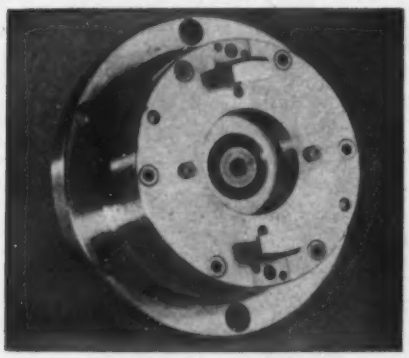
ROTARY TABLE—*Duro Mfg. Co., 800 E. 61 St., Los Angeles, Calif.* This 6-in. table is low enough to be used in usually inaccessible places. The table is 2⅛ in. high and has a 60 to 1 gear ratio. Feb. 4, 1943, p. 124.



PORTABLE VISE — *Patrick-McDermott & Co., 1645 E. Slauson, Los Angeles, Calif.* Wire rope and cable from ⅜ to 1¼ in. diameter can be handled without adapters. Aug. 19, 1943, p. 138.

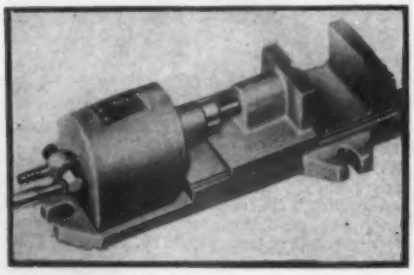


FIXTURE SET-UPS—*H. B. Rouse & Co., 2214-16 N. Wayne Ave., Chicago, Ill.* Several set-ups have been developed for use on the company's hand miller to eliminate preliminary tooling. Aug. 5, 1943, p. 138.



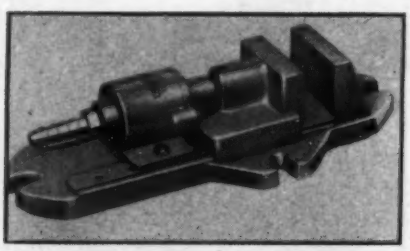
CHUCK—*Anker-Holth Mfg. Co., 332 S. Michigan Ave., Chicago, Ill.* Finger compensating units for uneven pieces are a feature of this air-operated chuck. It is made in sizes from 3 to 18 in. Mar. 4, 1943, p. 124.

VISE—*Wall-Colmonoy Corp., 720 Fisher Bldg., Detroit, Mich.*. The Strickland universal ball joint vise is suited for holding chip breakers, curlers and cutting tools for angle grinding. Sept. 16, 1943, p. 140.



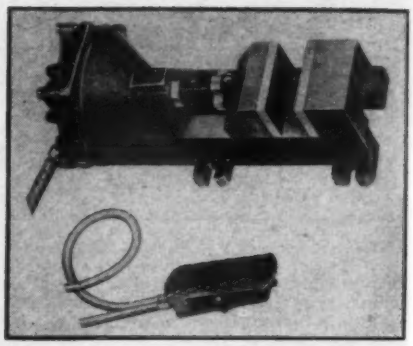
VISE AND ANGLE PLATE—*Wesson Co., 1050 Mt. Elliott Ave., Detroit, Mich.* Machining operations involving any angle can be handled on this vise and plate available in two sizes. No. 1 has jaw opening up to 4 in., and No. 2 has up to 1⅞ in. The vise swings 180, 90, and 360 deg. in the top, vertical and bottom planes respectively. May 27, 1943, p. 144.

VISE—*Williams Machine Co., Poultney, Vt.* The low grip of this milling machine vise holds the work close to the table. Sizes are available with jaws up to 7 in. wide with 5 in. opening. Apr. 29, 1943, p. 128.

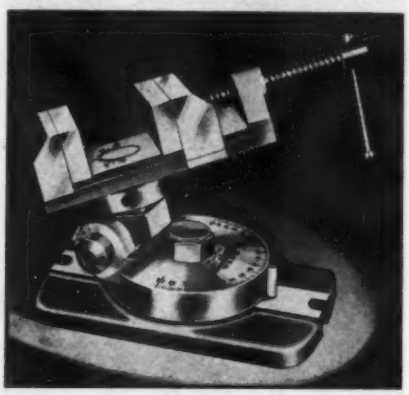


AIR VISE—*Mead Specialties Co., 15 S. Market St., Chicago, Ill.* The Model 10 midget vise handles light drill press and milling work. Three cylinder locations provide jaw openings in steps from 0 to 1⅞ in. Jaws 1¾ in. wide and 1 1/16 in. deep, are operated by a foot control valves. May 13, 1943, p. 136.

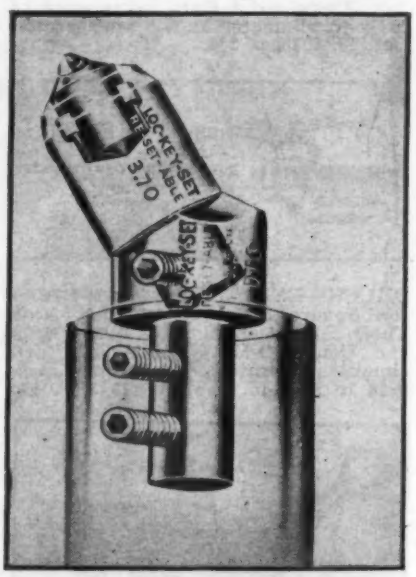
AIR VISE—*Mead Specialties Co., 15 S. Market St., Chicago, Ill.* Smaller setting on this Model 42 vise gives opening from 0 to 2 in., and larger settings with openings from 1⅜ to 3⅜ in. Two types of foot control valve are available. May 27, 1943, p. 134.



PNEUMATIC VISE—*W. R. Brown Corp., 5720 Armitage Ave., Chicago, Ill.* This air vise operates by foot control which stays open or closed without constant foot pressure. The movable jaw has a maximum travel of ½ in. Maximum opening of jaw is 3 in. Apr. 29, 1943, p. 128.

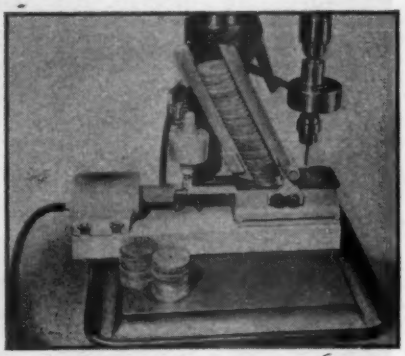


VISE—*Berco Mfg. Co., 429 W. Superior St., Chicago, Ill.* The Hilco all-angle Driv-Wheel movement vise, available in 3½, 4½ and 6 in. jaw widths, has double swivel base. Aug. 5, 1943, p. 132.



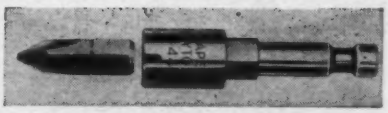
ANGLE-SET HOLDER — *Diamond Tool Co. 938 E. 41 St., Chicago, Ill.* This 30-deg. side angle lock set holder features rotation of the nib and can be used on wheels with from 1 to 6 in. radius. Apr. 1, 1943, p. 126.

FEED TABLE—*Porter-Cable Machine Co., Syracuse 8, N. Y.* For use with the company's G-4 belt type grinder, this in-out feed table is suited for surfacing disks, squares and other small parts. Sept. 16, 1943, p. 132.



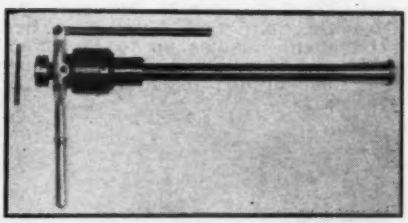
DISK-FEEDER—*Mead Specialties Co., 15 S. Market St., Chicago, Ill.* This is a semi-automatic fixture for feeding and holding work while drilling and tapping operations are performed. It handles work from 1 to 3 in. in diameter and from ¼ to ¾ in. thick. Mar. 18, 1943, p. 132.

TOOLBITS—*Triangle Tool Co., 2106 E. 22 St., Cleveland, Ohio.* This lathe toolholder mounts triangular shaped toolbits; only one flat grind is needed. The holder shape is such that large or small toolbits can be held without special shims or wedges. Sept. 16, 1943, p. 132.

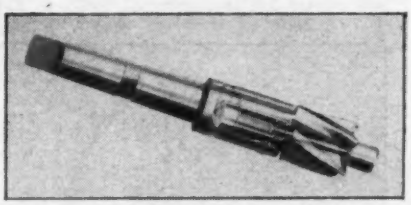


BIT HOLDER—*Apex Machine & Tool Co., Dayton, Ohio.* A series has been developed for bits used on power and hand drivers for Phillips recessed head screws. Dec. 9, 1943, p. 120.

COLLET CHUCK—*Erickson Steel Co., 2309 Hamilton Ave., Cleveland, Ohio.* The O1 model features a collet which is open slotted at both ends. Apr. 15, 1943, p. 136.

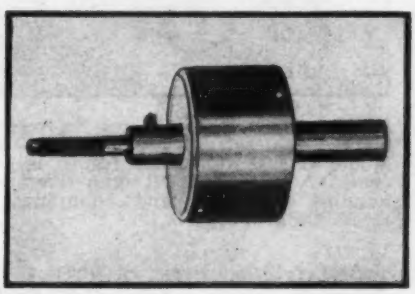


COLLET CLOSER—*Dix Mfg. Co., 603 E. 55 St., Los Angeles 11, Calif.* The Dix-Wilder unit is made to fit any lathe with ¾-in. holes, and accommodates 1-A collets. Sept. 2, 1943, p. 134.

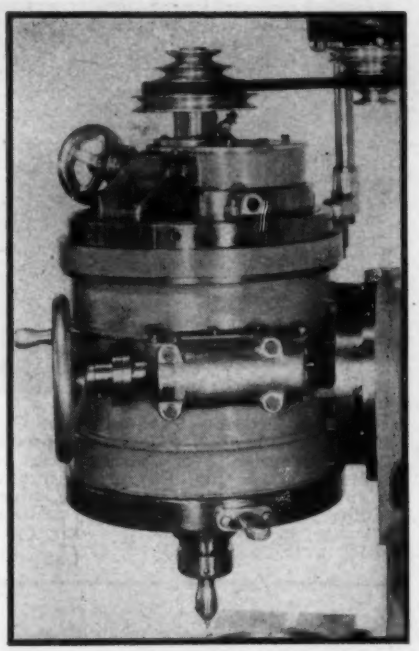


COUNTERBORE DRIVE — *Moreland Tool Co., 16035 W. McNichols Rd., Detroit, Mich.* This unit is available for a range of cutters up to and including 3 in. diameters, the drive can be supplied with straight or taper shank. Nov. 11, 1943, p. 134.

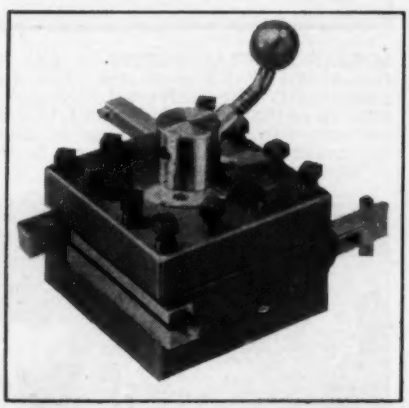
MAGNET-BLOCK—*Diamond Tool Co., 938 E. 41 St., Chicago, Ill.* A block is available to fit the 12-deg. Angle-Set tool made by this company. Not shown. June 24, 1943, p. 138.



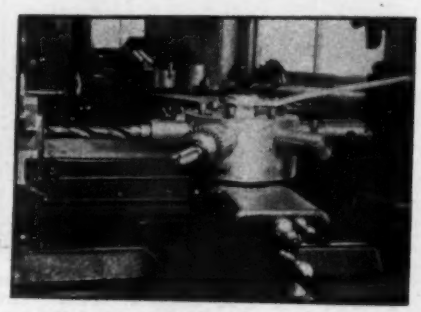
TAP HOLDER—*R. E. Uptegraff Mfg. Co., 126 Bridge St., Scottdale, Pa.* This holder is suited for use in a lathe turret or on a reversible drill press. June 10, 1943, p. 132.



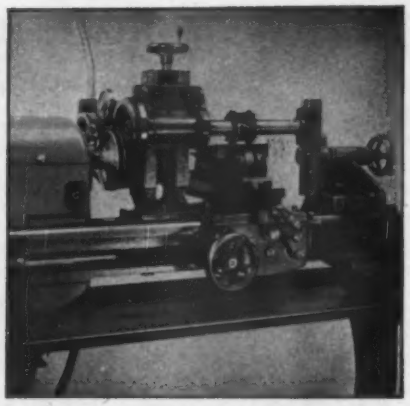
TOOL CARRIER — *Production Machinery Development Co., 4845-49 St. Aubin Ave., Detroit, Mich.* The Matthew rotary tool carrier can be fitted to any horizontal miller for contour milling work at one setting. The unit has 1 in. collet capacity. June 24, 1943, p. 132.



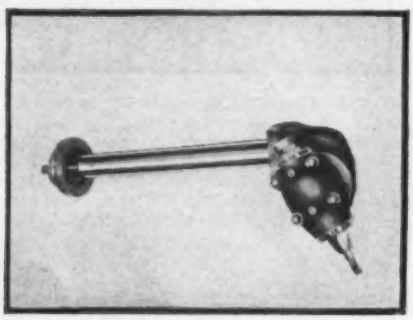
TOOLPOST TURRET—*Mark Naught Co., 2801 S. E. Milwaukie Ave., Portland, Oregon.* The Zero-Tol turret with automatic indexing comes in five block sizes. Oct. 14, 1943, p. 160.



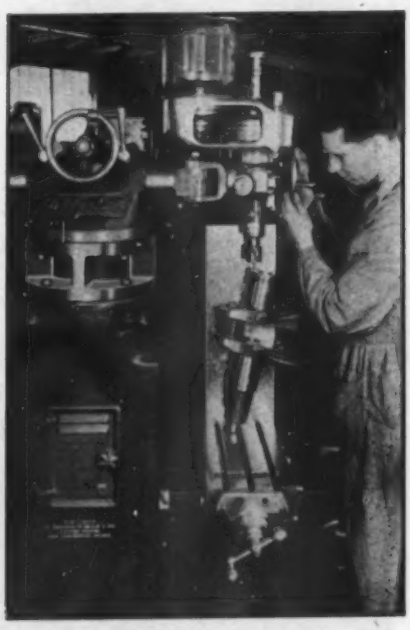
TOOLPOSTS—*Marco Co., 511 Monroe St., Wilmington, Del.* This toolpost fits any average lathe and is built in two sizes for six or eight tools. May 13, 1943, p. 133.



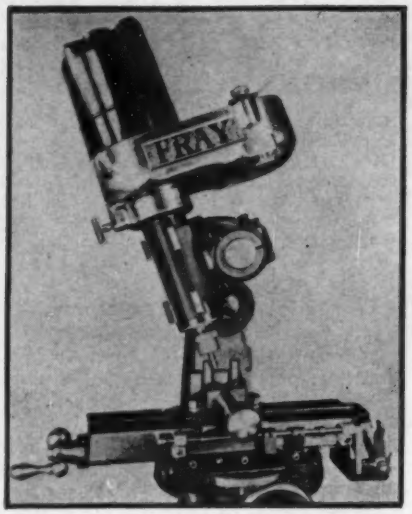
MILLER — *Globe Product Mfg. Co., 3380 Robertson Blvd., Los Angeles, Calif.* Designed for attachment to standard lathe, this unit does plain and angular milling, slotting, slitting, dovetailing, rack cutting, keyway cutting. Its use can increase lathe swing by 5 to 10 in. May 27, 1943, p. 144.



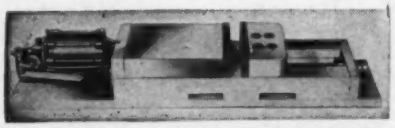
MILLING ATTACHMENT — *Leo G. Brown, 216 S. Vermont Ave., Los Angeles, Calif.* This universal high-speed attachment is suited for installation in overarm bore of most makes of milling machines; holds ¼, ⅜ or ½ in. collets. Aug. 5, 1943, p. 130.



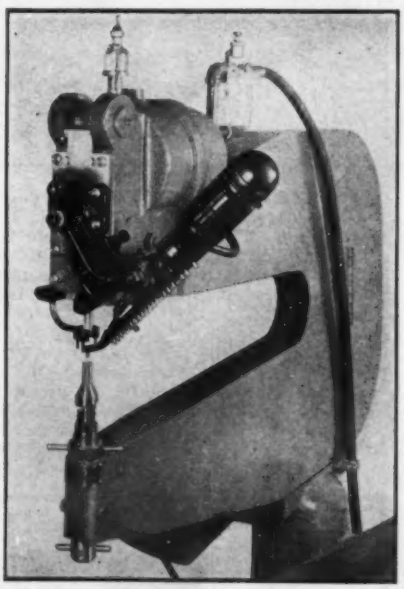
MILLING ATTACHMENT — *Hoover Tool & Die Co., Detroit, Mich.* The Hoover-Riser fits the standard Bridgeport milling machine to handle bulk work which requires a light cut and increases the machine over-all capacity 6 in. Aug. 19, 1943, p. 136.



MILLING ATTACHMENT—*Fray Machine Tool Co., 501 W. Windsor Rd., Glendale, Calif.* This Type F vertical attachment handles up to ½ in. end mills and is suited for use on bench and floor milling machines. May 27, 1943, p. 134.

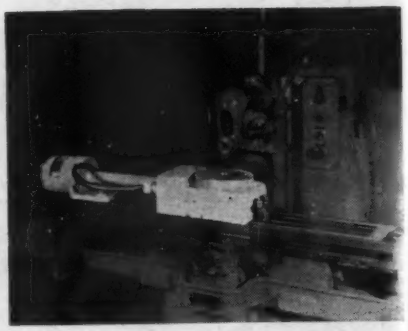


VISE—*Bellows Co., Akron, Ohio.* An air motor operates this vise for attachment to automatic milling machine; develops pressures up to 40,000 lb. The jaw opens 5⅜ in. Dec. 23, 1943, p. 124.

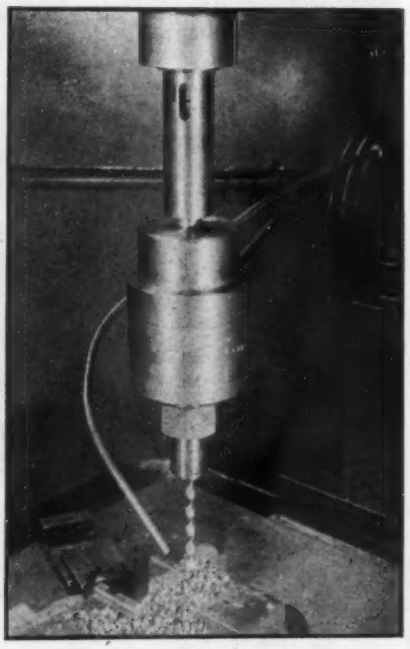


RIVET FEEDER—*General Engineering Co., 785 Hertel Ave., Buffalo, N. Y.* Model G-2300 automatic feeder is an accessory for the GBR type riveters; handles flat head and countersunk rivets. Aug. 5, 1943, p. 132.

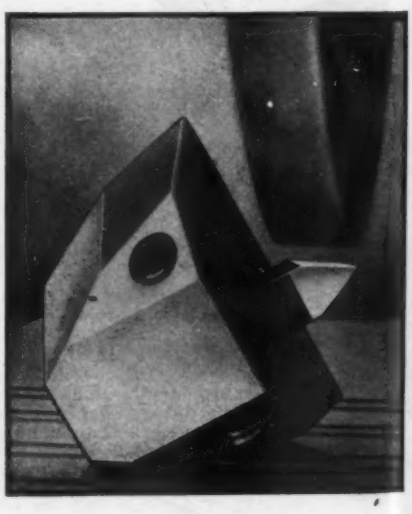
THREAD GRINDING FIXTURE — *Robert H. Clark Co., 3424 Sunset Blvd., Los Angeles 26, Calif.* Precision grinding 60 and 29 deg. threading round or square toolbits from ⅛ to ⅝ in. can be performed with this fixture. Sept. 16, 1943, p. 136.

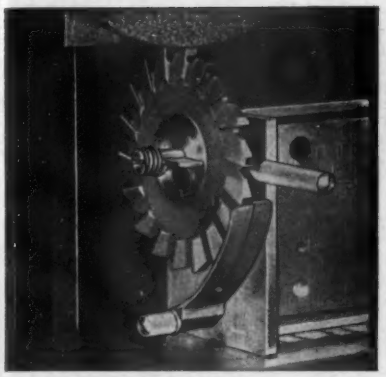


INDEX BASE — *Sundstrand Machine Tool Co., Rockford, Ill.* For horizontal and vertical milling, this automatic equipment is available in 8 and 12 in. diameter sizes. Dec. 23, 1943, p. 124.

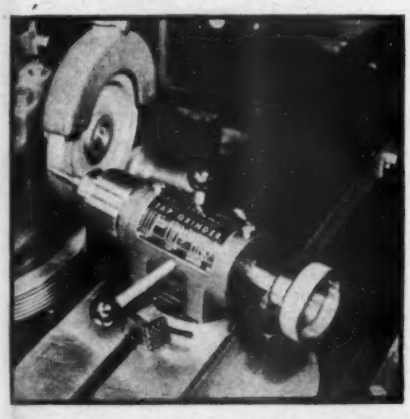


DRILLER—*Bastian-Blessing Co., 4203 Peterson Ave., Chicago 30, Ill.* The Rego Karweit driller fits any standard drill press and is available in two sizes for drills up to ¼ in. and ¼ to 9/16 in. Sept. 30, 1943, p. 122.

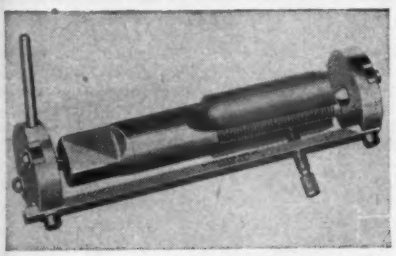




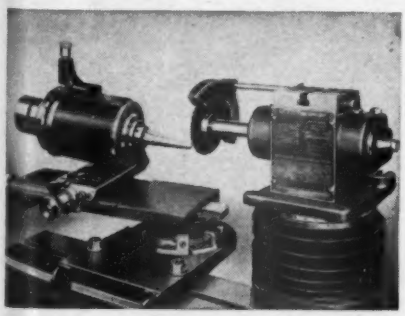
GRINDING FIXTURE—*Acro Tool & Die Works, 4892 N. Clark St., Chicago, Ill.* The Kutrite milling cutter grinding fixture is used to position milling cutters, circular saws, gear cutters, and other cutters on a surface grinder. Feb. 18, 1943, p. 152.



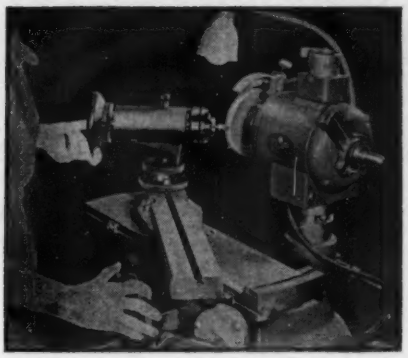
GRINDER ATTACHMENT—*Reading Machine Co., Reading, Ohio.* This attachment is suitable for use on any type of flat table grinder and most other grinding machines. Capacity up to ¾ in. hand tap. July 8, 1943, p. 146.



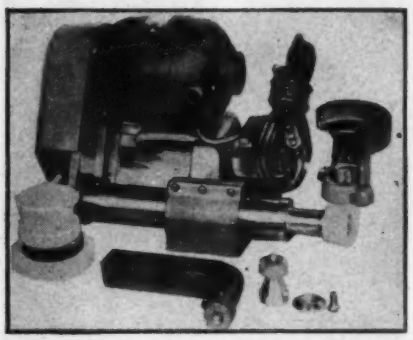
TAP GRINDING TOOL — *Minn-Kota Mfg. Co., Fargo, N. Dak.* Dull or worn taps can be reground with this tool. Nov. 25, 1943, p. 128.



RADIUS GRINDING ATTACHMENT —*Cincinnati Milling Machine Co., Cincinnati, Ohio.* This is a handy device for sharpening die sinking cutters; capacity up to 3 in. diameter ball nose. June 24, 1943, p. 128.

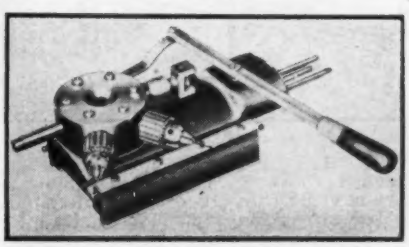


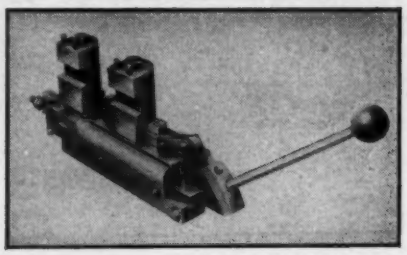
GRINDING FIXTURE — *Industrial Grinding Co., Los Angeles, Calif.* Countersinks of all types, integral pilot cutters and pilot drills, either right- or left-handed, center drills can be handled with this relief grinder fixture; made to fit any standard machine. Mar. 18, 1943, p. 126.



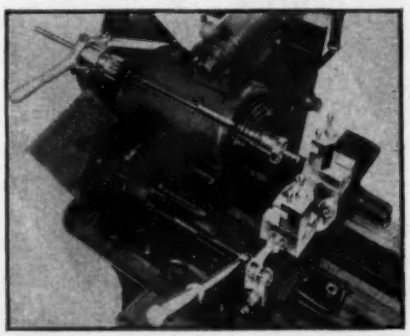
GRINDER — *Lempco Products, Inc., 5700 Dunham Rd., Bedford, Ohio.* This is a small heavy-duty tool-post grinder suited for internal, external, face and taper grinding holes 8½ in. deep. Apr. 29, 1943, p. 117.

GRINDING FIXTURE — *Industrial Engineering Co., 141 W. Jackson Blvd., Chicago, Ill.* Ind-L-Way twist drill grinding fixtures are available for drills in sizes from ¼ to ¾ in., and from ¾ to 2⅞ in. Dec. 23, 1943, p. 132.

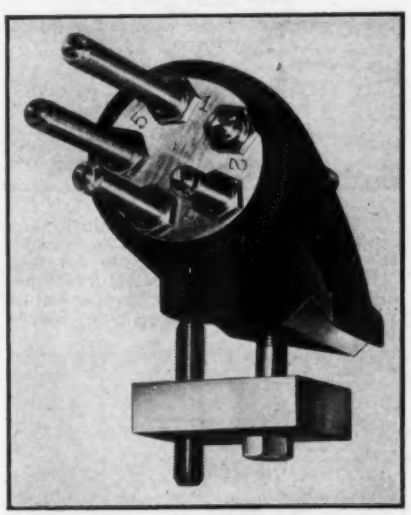




CROSS-SLIDE ATTACHMENT—*General Die-Stamping Tool Co., 265 Canal St., New York 13, N. Y.* For such operations as cutting off, forming, chamfering and grooving, this lever-type attachment can be fitted to most bench lathes. Oct. 28, 1943, p. 126.

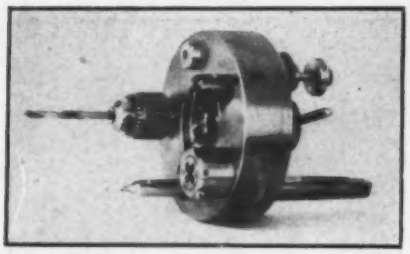


LATHE ACCESSORIES—*Kessler Aero Products Co., 211 W. Palm Ave., Burbank, Calif.* Two accessories developed by this company will convert small and medium size engine lathes to hand screw machine speed ranges. Recommended for lathes with ¾ in. spindle capacity. Mar. 18, 1943, p. 134.

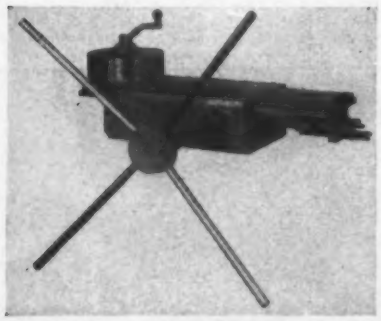


LATHE ATTACHMENT — *Marshall Tool & Supply Co., 122½ Santa Fe Ave., Los Angeles, Calif.* Five position settings are provided in this Multi-Stop attachment for all V-bed and Atlas-Craftsman lathes. Sept. 2, 1943, p. 140.

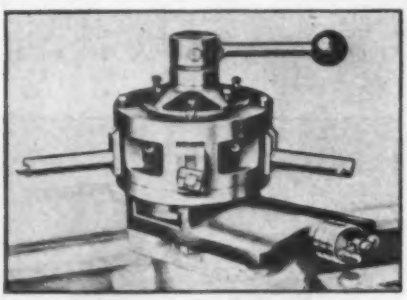
TURRET ATTACHMENT — *Kessler Aero Tool Co., 211 W. Palm Ave., Burbank, Calif.* Six tool stations are provided in this self-indexing bed turret, together with six individual stops indexing with the turret. Oct. 14, 1943, p. 146.



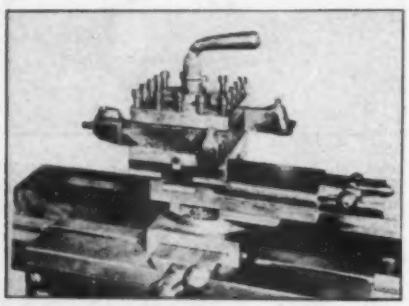
TAILSTOCK TURRET — *Master Machine Co., 433 Main St., Stamford, Conn.* Use of five different tools is permitted on this attachment. Sept. 2, 1943, p. 138.



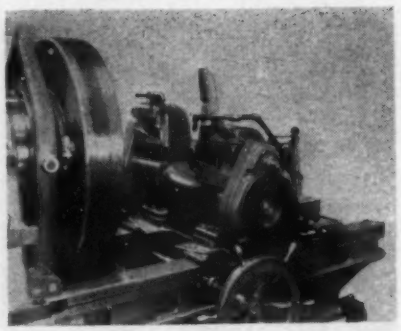
TURRET ATTACHMENT—*United Industries, 4 E. Buena Vista Ave., Detroit, Mich.* An engine lathe can be converted into a hand-screw machine with this attachment made for 10, 12, 14 and 16-in. lathes. June 24, 1943, p. 128.



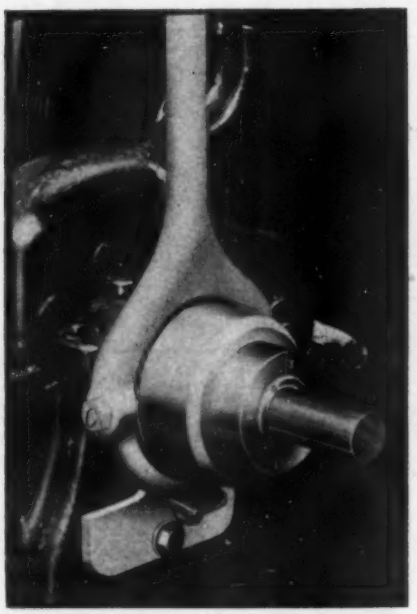
LATHE TURRET — *Automatic Machine & Tool Co., 132 Charles St., Auburndale, Mass.* Available for four lathe sizes, this tool-block turret permits five-station set-ups, and possibility for indexing in 10 positions. July 8, 1943, p. 142.



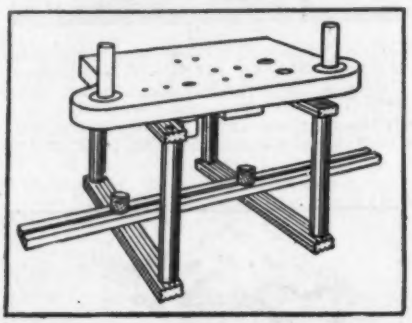
TOOLPOST TURRET—*Vital Machine & Tool Co., 325 E. 16 St., Brooklyn, N. Y.* The Sure-Lock square base turret for engine lathes, available in three sizes, has automatically operated key lock. Feb. 4, 1943, p. 114.



CUTTING OFF UNIT — *Landis Machine Co., Waynesboro, Pa.* This hydraulically controlled unit replaces the standard carriage, cross-rail and diehead of the Landis mill-type pipe threading machine where used only for cutting off operations. Jan. 7, 1943, p. 113.

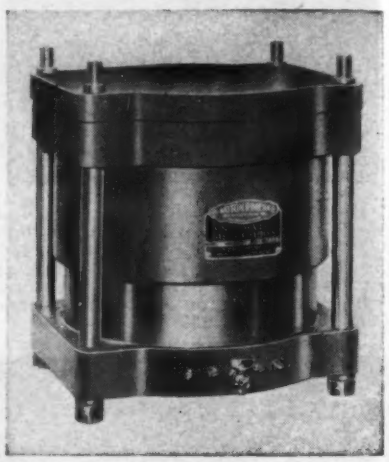


COLLET CHUCK—*Hall Mfg. Co., 622 Tularosa Drive, Los Angeles, Calif.* The Model A collet chuck operates by hand touch, and fits all lathes with 1½-in. 8-thread spindles. Model B fits 1¾-in. spindles. July 22, 1943, p. 136.

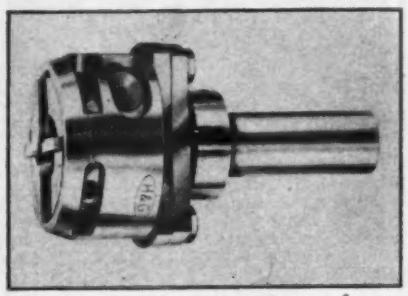


DIE CRADLE—*Acro Tool & Die Wks., 4892 N. Clark St., Chicago, Ill.* This is a 3-inch unit designed to handle small work sizes. May 13, 1943, p. 138.

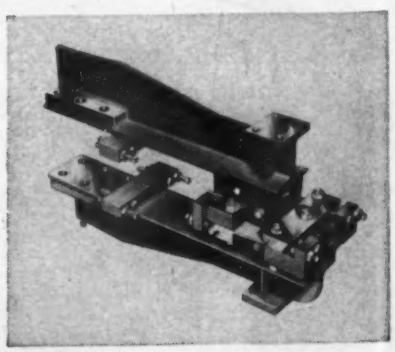
AIRCRAFT DIES—*Algoma Products, 3080 East Outer Drive, Detroit, Mich.* Blanking and piercing dies for aircraft can be produced from templets or parts themselves. They are self-stripping and self-ejecting. Available for either single, compound or progressive operation. Not shown. June 10, 1943, p. 140.



DIE CUSHION—*Dayton Rogers Mfg. Co., 2835 Twelfth Ave. S., Minneapolis, Minn.* Designed for mounting directly to bolster plate of most power punch presses, this unit is built in sizes from 6 to 24 in. Dec. 23, 1943, p. 124.

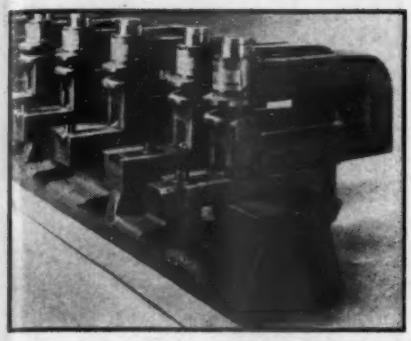


DIEHEAD—*Eastern Machine Screw Corp., Truman and Barclay Sts., New Haven, Conn.* Style SAML solid adjustable insert-chaser dieheads can be furnished from 0 to 1½ in., suitable for cutting thread lengths from 1 3/16 to 1 7/16 in. July 8, 1943, p. 144.



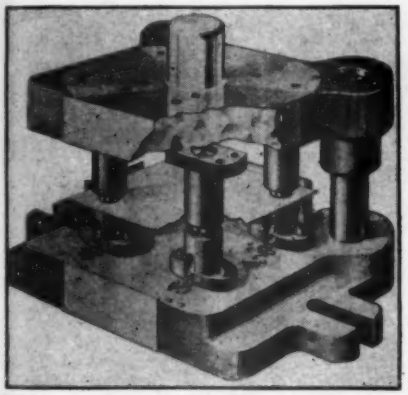
DIE SET—*Leslie Welding Co., 2943 Carroll Ave., Chicago, Ill.* The range of work that can be done on press brakes is increased by the use of this self-balancing equipment. Nov. 25, 1943, p. 125.

HOLE PUNCHING UNIT — *Strippit Corp., North Tonawanda, N. Y.* This Wales Type E unit punches a series of holes simultaneously in shape on press brakes. Not shown. Apr. 1, 1943, p. 120.



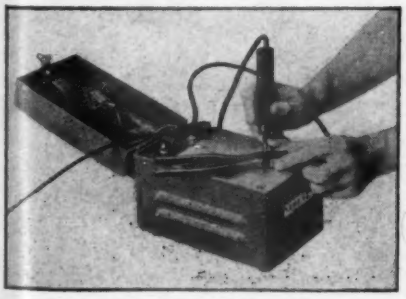
HOLE PUNCHING UNITS—*Wales-Strippit Corp., 345 Payne Ave., N. Tonawanda, N. Y.* Type B unit for interchangeable use on press brakes, rails, T-slotted plates and templets for punch presses has adjustable adapters for staggered and straight line punching. Aug. 5, 1943, p. 138.

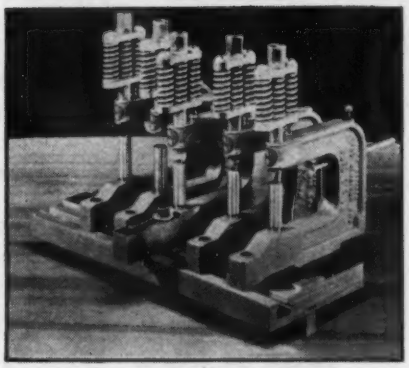
HOLE PUNCHING UNIT — *Wales-Strippit Corp., North Tonawanda, N. Y.* Type AA units can be used on press brakes and stamping presses; provided with three spring stripping guide assembly for metals up to ⅛ in. thick, or single spring for metals up to 0.076 in. thick. Not shown. Sept. 16, 1943, p. 128.



HOLE PUNCHING UNITS — *Wales-Strippit Corp., 345 Payne Ave., N. Tonawanda, N. Y.* The Wales CD units are used in either press brakes or punch holes from 1/16 to 1⅛ in. diameter in metal up to No. 11 gage. Feb. 18, 1943, p. 144.

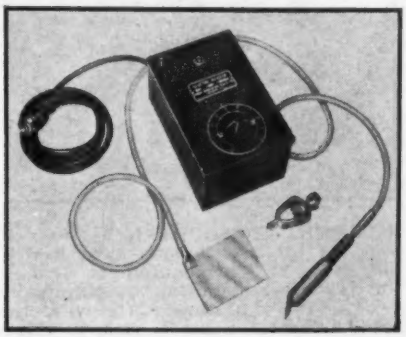
SPRING STRIPPING UNIT—*Wales-Strippit Corp., N. Tonawanda, N. Y.* Strippits allow removal of stripper plates without taking die out of press or disturbing set-up; available in lengths from 2½ to 6 in. Not shown. May 27, 1943, p. 144.





HOLE PUNCHING UNIT — *Wales-Strippit Corp., N. Tonawanda, N. Y.* The Type CA unit has built-in adjustable adapter with adjustment up to 1½ in. front to back. Available in punched hole line up to 5/16 in. July 22, 1943, p. 138.

ETCHER—*Grinding Machinery Co., 2832 E. Grand Blvd., Detroit, Mich.* This is a combination etcher and demagnetizer for marking all types of metal. Mar. 4, 1943, p. 132.



MARKER—*H. P. Preis Engraving Machine Co., 157 Summit St., Newark, N. J.* Available for 115 or 230 volts a.c., this free-hand electrical marker is used for placing numbers, symbols and identifications on soft or hardened steel. Sept. 2, 1943, p. 126.

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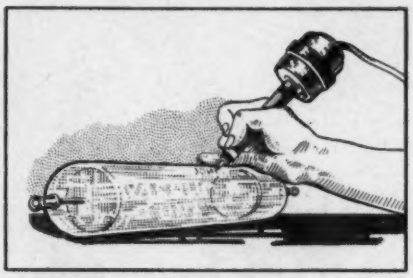
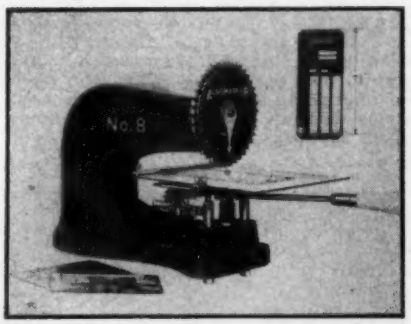
ETCHER—*Ideal Commutator Dresser Co., 1057 Park Ave., Sycamore, Ill.* The No. 13 Model, operating on 115 volts, 50 or 60 cycle a.c., permanently marks small tools and larger parts made of steel, iron or their alloys. No. 3, Feb. 4, 1943, p. 116.



WRITING TOOL — *Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago, Ill.* This electric tool provides permanent marking on brass, glass, plastics, hard-rubber, aluminum, wood, steel and bronze. Sept. 30, 1943, p. 126.



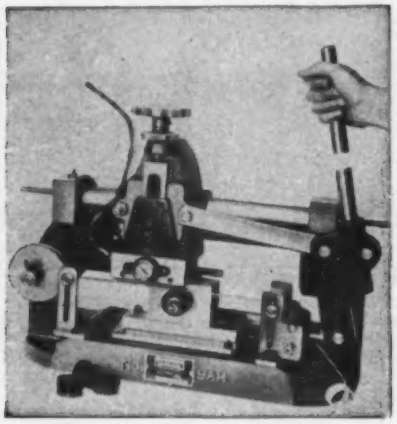
STAMPING MACHINE — *Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* No. 8 Acromarker nameplate machine stamps on wood or metal parts, handling pieces up to 2½ in. thick. Oct. 28, 1943, p. 124.

STAMPING OUTFIT—*Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* The No. 3 Hercules hot stamping outfit marks crystal holders. Also suitable for cold stamping of name plate and other parts. Not shown. Jan. 7, 1943, p. 120.

NAMEPLATE STAMPING MACHINE —*Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* The No. 1F machine is a pedal-operated nameplate and parts stamping machine. Not shown. Mar. 4, 1943, p. 126.

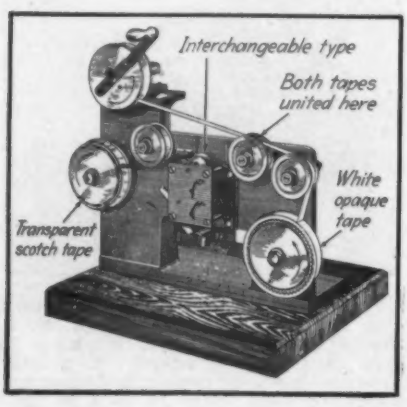
MARKING MACHINE—*Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* No. 924 hand-operated bench type marker is used to mark condenser caps. Not shown. Nov. 25, 1943, p. 130.

CYLINDER MARKER — *Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* Model 12B machine for marking 20 mm. shot, can be adapted to similar products made of copper, brass, or unhardened steel. June 24, 1943, p. 126.

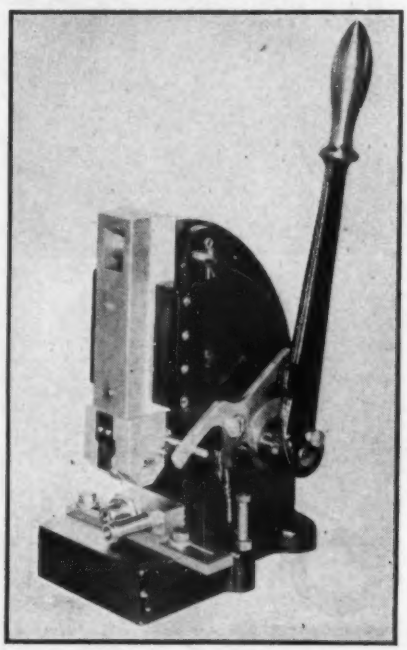


MARKING MACHINE — *Acromark Co., 7-13 Morrell St., Elizabeth 4, N. J.* The 9 AH machine marks flat and cylindrical parts, and takes the place of engraving and filling by marking in color with an electric heating element. Dec. 23, 1943, p. 124.

MARKING MACHINE—*Jas. H. Matthews & Co., Pittsburgh, Pa.* Numbers, names, and special lettering can be marked on parts up to 6 in. in diameter or thickness on this machine which handles flat or round parts. Oct. 28, 1943, p. 132.



MARKING MACHINE — *Wm. A. Force & Co., 216 Nichols Ave., Brooklyn, N. Y.* This is a hand machine for numbering and marking thin-walled tubing, bezels and similar cylindrical parts. June 10, 1943, p. 130.



NUMBERING MACHINE — *Wm. A. Force & Co., 216 Nichols Ave., Brooklyn 8, N. Y.* This equipment is used for serially numbering automatically two or more mating parts with the same number. Sept. 2, 1943, p. 140.

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MARKING DEVICE—*York Electric Machine Co., 1241 W. King St., York, Pa.* Codes and symbols can be marked on scotch tape with this machine. Printing is impervious to gasoline and oil. Available for five widths of tape. July 8, 1943, p. 146.

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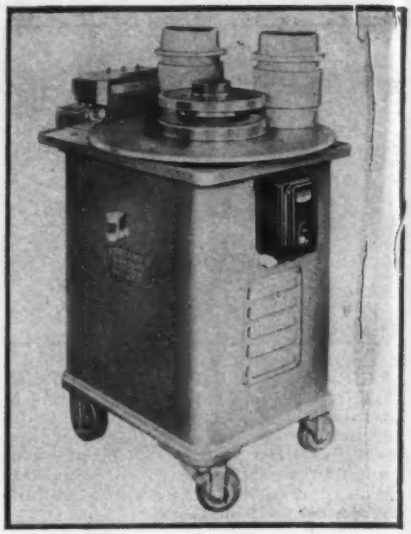
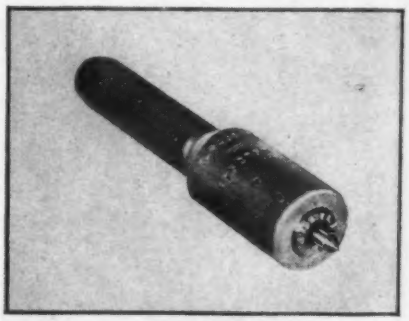
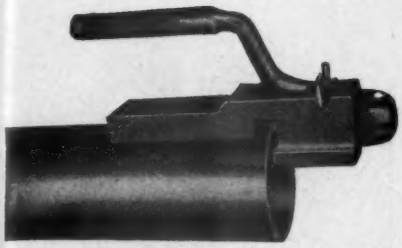
TYPE HOLDER—*Jas. H. Matthews & Co., Pittsburgh, Pa.* This is an interchangeable steel type holder suited for hand or press stamping applications. Feb. 18, 1943, p. 150.



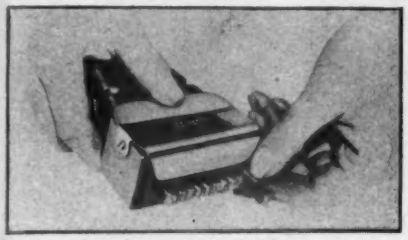
MARKING MACHINE—*Noble & Westbrook Mfg. Co., Westbrook St., E. Hartford, Conn.* This equipment marks identification data into the periphery of aircraft engine cylinder barrels. Parts from ¼ up to 8 in. diameter can be accommodated. May 27, 1943, p. 136.



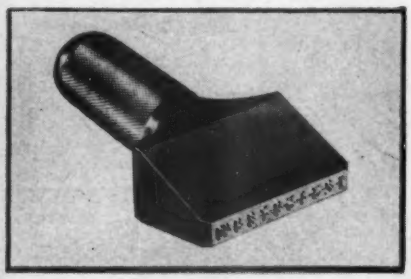
TYPE HOLDER—*New Method Steel Stamps, Inc., 145 Jos. Campau St., Detroit, Mich.* This holder is suited for marking ends of shafts and other parts having a center hole. Apr. 1, 1943, p. 126.



SHELL MARKER — *M. E. Cunningham Co., 115 East Carson St., Pittsburgh 19, Pa.* End of hot, rough turned shell can be marked with the box-type holder which holds any size or number of characters. Sept. 30, 1943, p. 128.

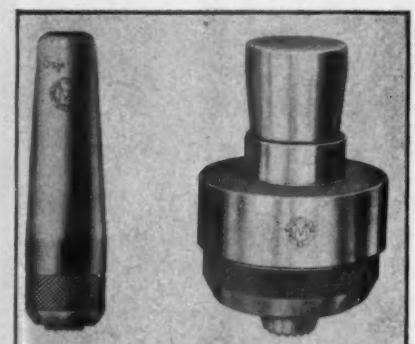


MARKING STAMP — *Acromark Co., 7-13 Morrell St., Elizabeth, N. J.* The Hercules type holder has thumb pressure clip and marks multiple characters that change. Mar. 4, 1943, p. 136.

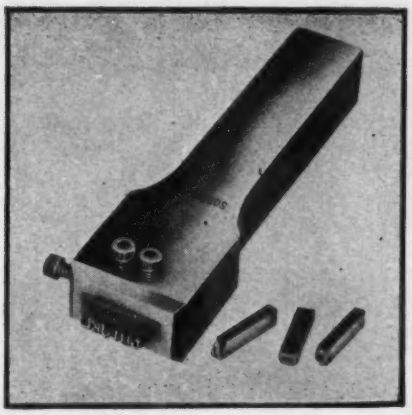


SEQUENCE MARKER—*New Method Steel Stamps, Inc., 143 Jos. Campau St., Detroit, Mich.* This hand stamp has a number of consecutive numerals corresponding to operations inspected. May 27, 1943, p. 144.

TYPE HOLDER—*New Method Steel Stamps, Inc., 145 Jos. Campau St., Detroit, Mich.* Designed for mounting in mechanical or hydraulic presses, this holder is available for type ranging from 1/32 to ¼ in. Not shown. Feb. 4, 1943, p. 122.

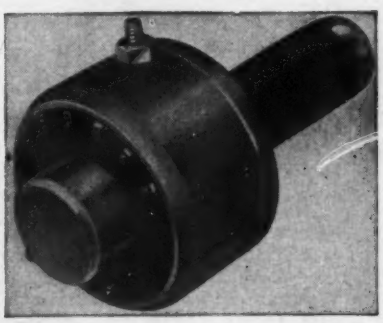


TYPE HOLDER—*Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh, Pa.* This ring style holder is suited for curved line marking of parts ¼ to 6 in. diameter. May 13, 1943, p. 140.

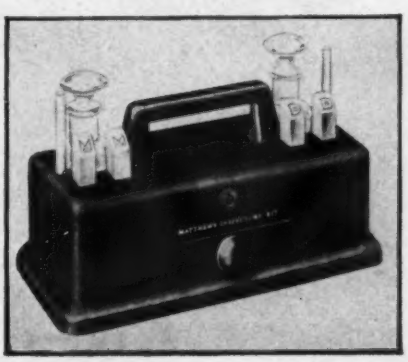


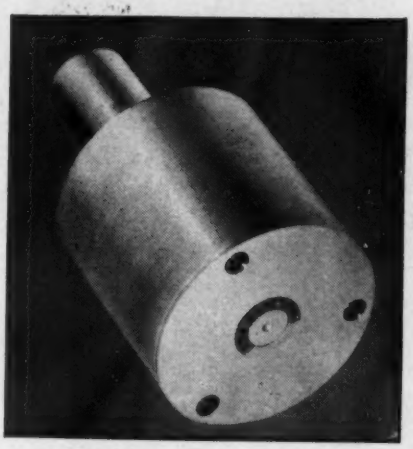
TYPE HOLDER—*Sossner Tool & Machine Works, 161 Grand St., New York, N. Y.* This holder accommodates up to eight pieces of type and is suited for hand and press use. June 10, 1943, p. 136.

MARKING HOLDER—*M. E. Cunningham Co., 115 E. Carson St., Pittsburgh 19, Pa.* This device is applicable to operations previously using hand or sledge holders. Nov. 25, 1943, p. 132.

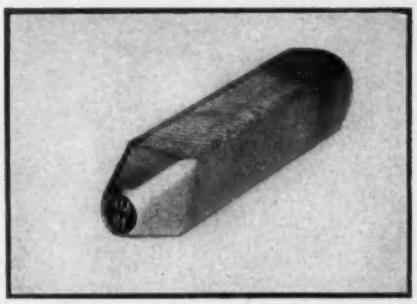


GEAR MARKER — *M. E. Cunningham Co., 115 E. Carson St., Pittsburgh 19, Pa.* This holder is offered in a safety hand model. The type plate is cut out for exact number of characters and letters desired. Nov. 11, 1943, p. 130.

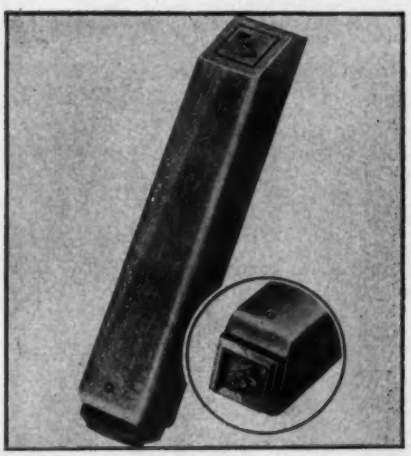




TYPE HOLDER—*Wm. A. Force Co., 216 Nichols Ave., Brooklyn 8, N. Y.* Flat circular pieces on a variety of radii can be marked. Aug. 19, 1943, p. 136.



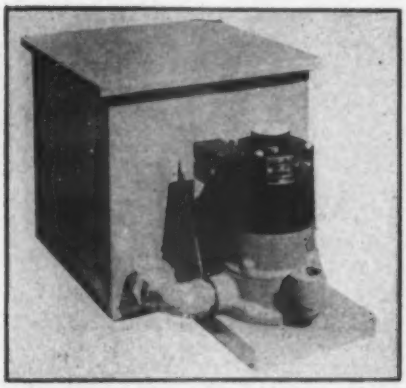
INSPECTION STAMP—*New Method Steel Stamps, Inc., 147 Jos. Campau St., Detroit 7, Mich.* This stamp, with letters MF for identifying magnafluxed parts, can be supplied in a variety of shapes. Sept. 30, 1943, p. 122.



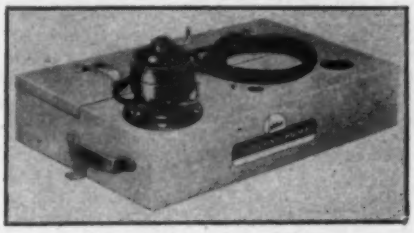
SYNTHETIC STAMP—*Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh, Pa.* Acid etching ink does not affect this stamp. Mar. 18, 1943, p. 140.

STAMP KIT—*Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh, Pa.* This kit is used in marking duplications on steel parts with acid etching ink. July 22, 1943, p. 136.

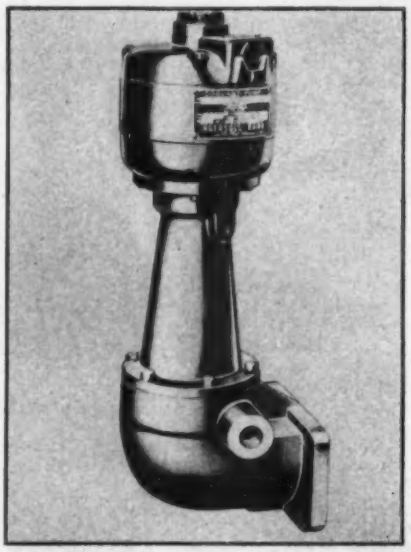
SLEEVE HOLDER—*M. E. Cunningham Co., 95 E. Carson St., Pittsburgh, Pa.* This unit for marking on small, round, and square pieces, can be made with any size or number of characters. Aug. 5, 1943, p. 140.



COOLANT PUMP — *Brady-Penrod, Muncie, Ind.* The Model 600 is adaptable for any type of coolant in general use, and on any type machine for single or multiple installations. Apr. 29, 1943, p. 132.



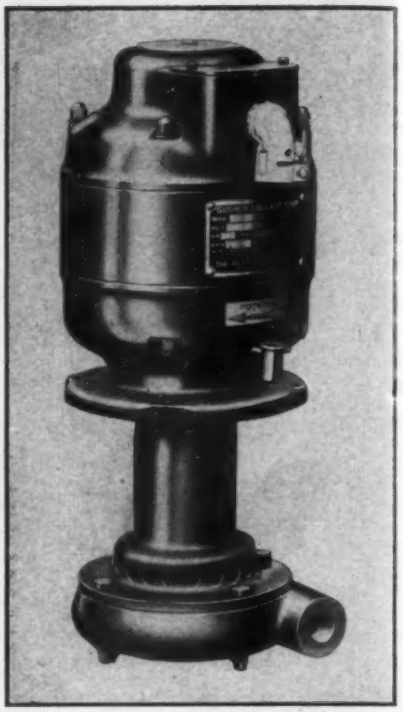
COOLANT PUMP — *Atlas Press Co., Kalamazoo, Mich.* This portable equipment is of centrifugal type, equipped with tank, and available in two motor sizes and capacities. Mar. 4, 1943, p. 124.



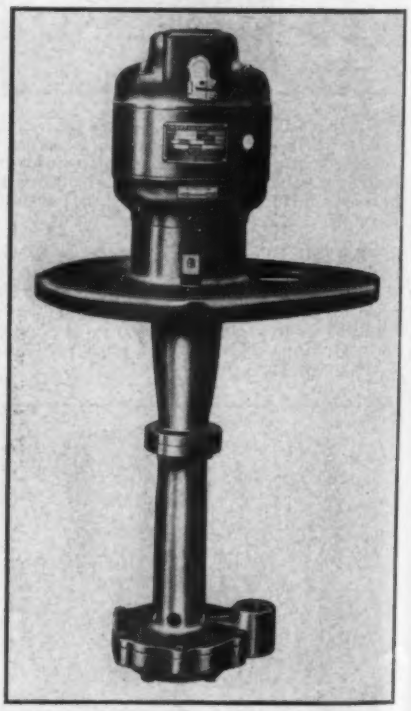
COOLANT PUMP—*Ingersoll-Rand Co., 11 Broadway, New York, N. Y.* This unit available in several types is suited particularly for installation on machinery where a constant supply of cooling fluid or cutting oil is necessary. Mar. 4, 1943, p. 132.

COOLANT PUMP — *Brady-Penrod, Inc., 1220 W. Second St., Muncie, Ind.* This foot-mounted unit is an instantly self-priming centrifugal pump, that will handle abrasive and steel chips. Mar. 18, 1943, p. 138.

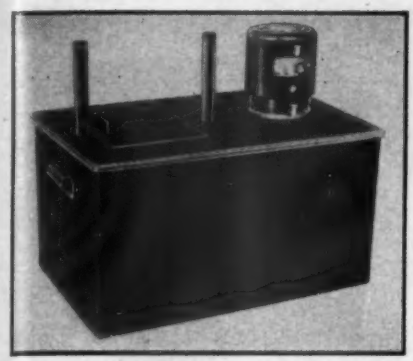
COOLANT PUMP—*Pioneer Pump & Mfg. Co., 19669 John R, Detroit, Mich.* Model MVA is a seal-less unit for use on small machines. Nov. 25, 1943, p. 138.



COOLANT PUMP—*Ruthman Machinery Co., 1810 Reading Rd., Cincinnati, Ohio.* Model 9040 immersed type motor driven Gusher pump is equipped with bracket for reservoir cover or bedplate mounting. Oct. 28, 1943, p. 130.

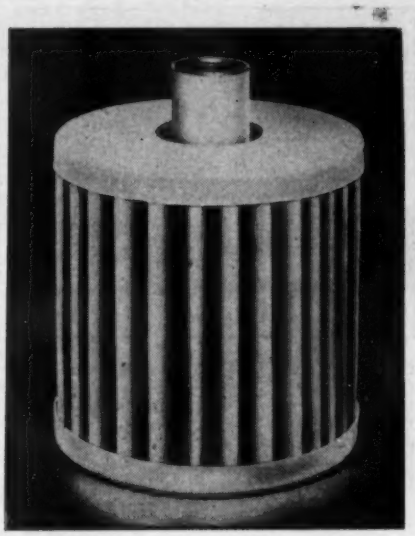


COOLANT PUMP—*Ruthman Machinery Co., 1810 Reading Rd., Cincinnati, Ohio.* Model TL gusher unit has been developed for deeper immersion, handles soluble coolant containing grit and abrasive without injuring mechanism. Aug. 5, 1943, p. 134.



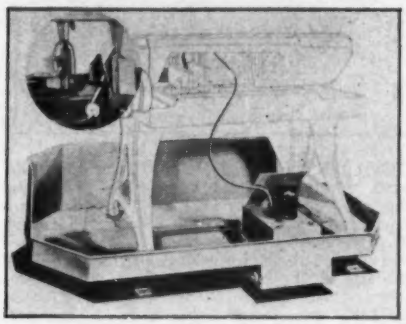
COOLANT PUMP—*Eastern Engineering Co., 45 Fox St., New Haven, Conn.* Model 16-S is a self-contained portable unit for lathes, shapers, milling machines, grinders and drill presses. Sept. 2, 1943, p. 140.

COOLANT PUMP—*Practical Products Co., 1629 University Ave., St. Paul, Minn.* The Kleer-Flo Kool-Ant Cir-Ku-Lator is suited for milling machines, screw machines, drill presses, grinders, lathe and cutoff saws; tapping capacity is 8 gal. Apr. 29, 1943, p. 132.



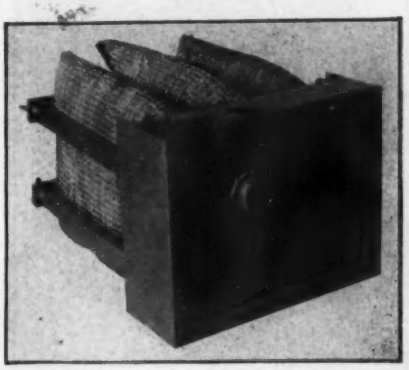
FILTER—*Steynew Filter Corp., 11 Centre Park, Rochester, N. Y.* The SE model sump type liquid filter fits on the end of a pump suction line and is submerged in the settling basin or sump to protect pump from abrasive particles. Aug. 19, 1943, p. 136.

COOLANT PUMP—*Pioneer Pump & Mfg. Co., 19669 John R, Detroit, Mich.* This unit provides coolant flow to small machines such as hand mills, drill presses and tapping machines. Sept. 16, 1943, p. 138.

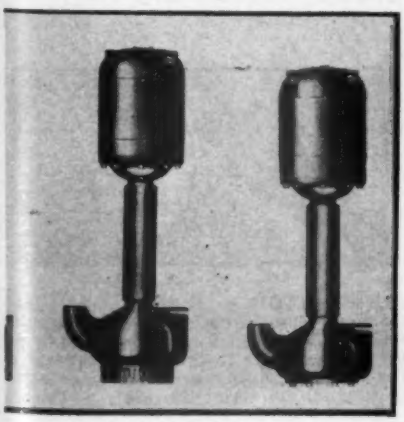


COOLANT SYSTEM—*Gray-Mills Co., 213 W. Ontario St., Chicago, Ill.* The Model MS-20 unit is used on all types of horizontal bandsaws. Apr. 29, 1943, p. 130.

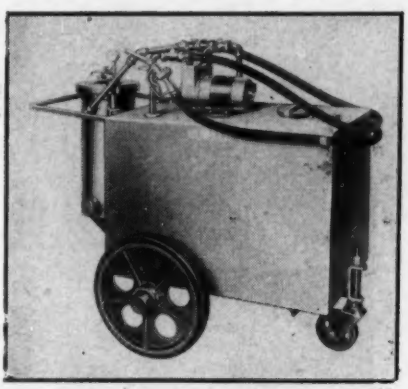
OIL FILTER—*Hilliard Corp., 370 W. Fourth St., Elmira, N. Y.* The Hilco is a portable unit available in sizes from 1 gal. per min. up to several hundred barrels per hr. July 22, 1943, p. 142.



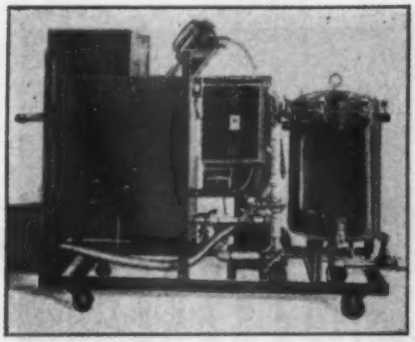
COOLANT STRAINERS—*Metal Textile Corp., Orange, N. J.* Two supercapacity types of Metex strainers for internal and external grinders and screw machine uses are available with capacities from 15 to 60 gal. per min. Mar. 18, 1943, p. 140.



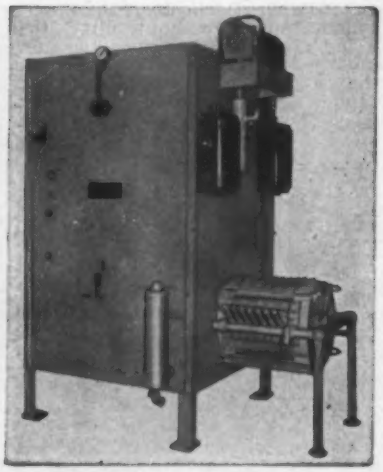
COOLANT PUMPS—*Pioneer Pump & Mfg. Co., Detroit, Mich.* Model VBD has three outlets, and Model VA is used for submersion in the coolant sump, while Model VC seryes for external use where tank cannot be mounted with vertical or horizontal bracket. June 24, 1943, p. 138.



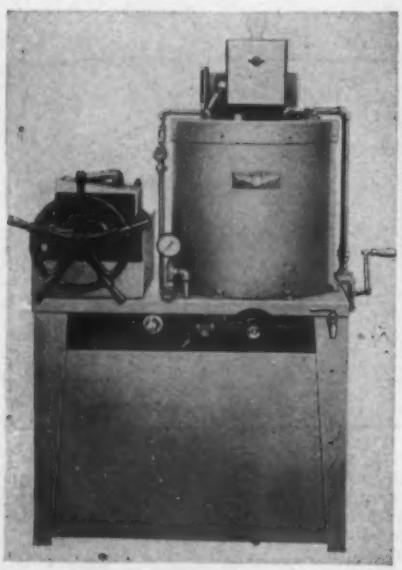
OIL FILTER UNIT—*S. F. Bowser & Co., Fort Wayne 5, Ind.* Periodic filtering of lubricating oils in gear sumps and cases, hydraulic oils and similar products can be handled in this portable equipment, which has 85-gal. tank capacity. Oct. 14, 1943, p. 158.

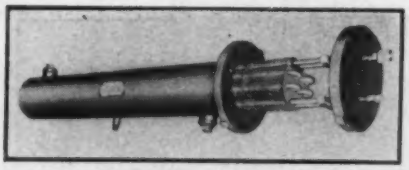


OIL TREATING UNIT—*Sparkler Mfg. Co., 303 Lake St., Mundelein, Ill.* Grinding and honing oils can be reconditioned with this equipment and restored to original efficiency. Equipment includes 100-gal. mixing and heating tank. Oct. 14, 1943, p. 150.

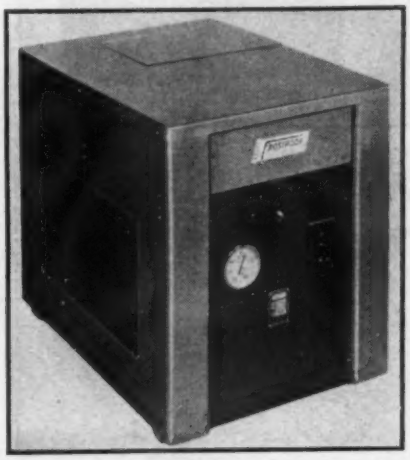


OIL PURIFIER—*Hilliard Corp., 370 W. 4 St., Elmira, N. Y.* The Hilco Airline purifier is suited for many industrial lubricating oils. Available in sizes from 50 to 130 gal. per batch per hour. Oct. 28, 1943, p. 122.





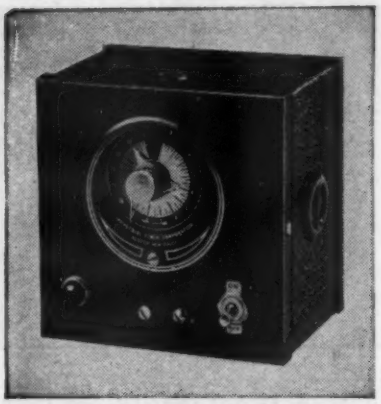
COOLANT COOLER — *Kramer Trenton Co., Trenton 5, N. J.* This shell and fin tube type cooler is designed for use with water, brine or direct expansion refrigerant. Aug. 19, 1943, p. 138.



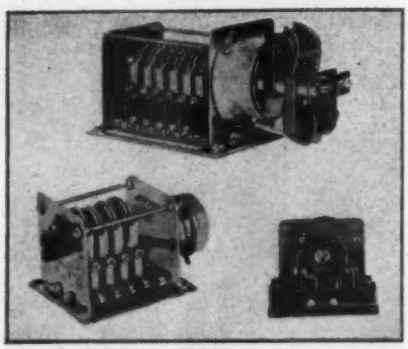
COOLANT COOLER—*Frostrode Products, 19003 John R St., Detroit 3, Mich.* An air-cooled compressor is utilized in this unit which is adaptable to most any type of machine and operation involving the use of coolants. Its capacity is 18 gal. per min. to 20 F. below room temperature. Sept. 2, 1943, p. 138.

COOLANT COOLER—*Gray-Mills Co., 213 W. Ontario St., Chicago, Ill.* Model 400 industrial fluid cooler mechanically refrigerates fluids, settles and screens out chips and coarser abrasives. The cooling tank has 35-gal. capacity. Nov. 11, 1943, p. 134.

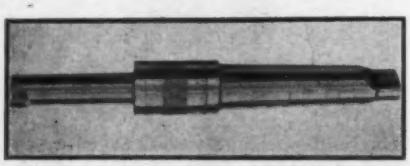
OIL RECLAIMER — *Youngstown-Miller Co., Sandusky, Ohio.* Restores used oils to substantially same values as new at the rate of 8 gal. in 70 to 90 min. July 22, 1943, p. 142.



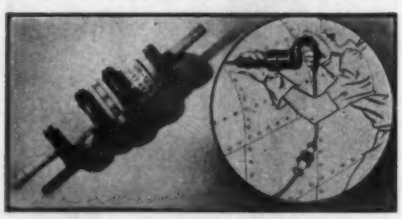
TIMER—*Industrial Timer Corp., 117 Edison Place, Newark, N. J.* Series S signalling timer provides visual and audible time cycle; provides for automatic closing or opening of a circuit. Dec. 23, 1943, p. 135.



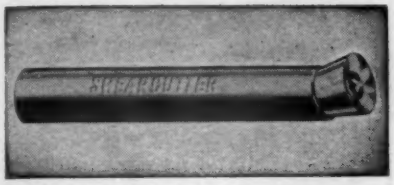
TIMER—*R. W. Cramer Co., Inc., Centerbrook, Conn.* This multi-contact unit automatically controls sequence of "on" and "off" operations of single or multiple number of electrical circuits. Feb. 18, 1943, p. 152.



BORING BAR—*Universal Engineering Co., Frankenmuth, Mich.* Mikro-Lok self-locking jig boring bar for finishing cuts has micrometer adjustment; seven size ranges are offered for holes from ¾ to 4 in. Sept. 2, 1943, p. 140.



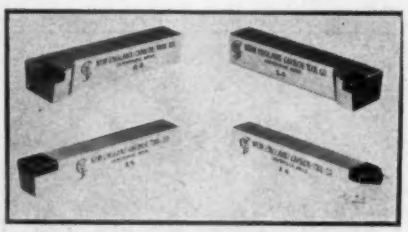
LUBRICATOR — *Filters, Inc., 1515 Gardena Ave., Glendale, Calif.* The Air-Lube unit is used for feeding regulated oil mist into air tools to eliminate need for frequent oiling or for air passages in a machine. Aug. 19, 1943, p. 138.



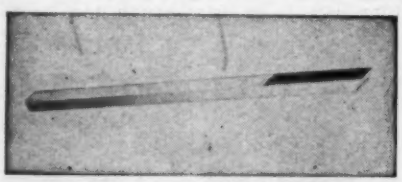
BORING BIT — *Shearcut Tool Co., 19600 Sherman Way, Reseda, Calif.* The Shearcutter bit has circular cutting edge and provides diamond boring machine results from an ordinary lathe. Dec. 23, 1943, p. 126.

BURRING TOOL — *Tools Improvements Co., Merrick Rd., Seaford, L. I., N. Y.* The Burroff tool removes the burr and sharp edges produced after drilling a hole through any yoke or forked-shaped part. Four tools available for holes from ⅛ to 1 in. Not shown. Oct. 14, 1943, p. 148.

CARBIDE CUTTERS — *M. A. Ford Mfg. Co., 732 W. First St., Davenport, Ia.* The line of carbide rotary cutters is available in five different shapes and 10 sizes. Oct. 28, 1943, p. 124.

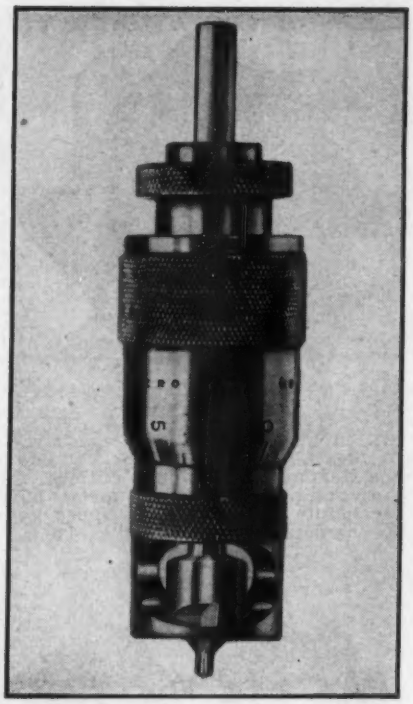


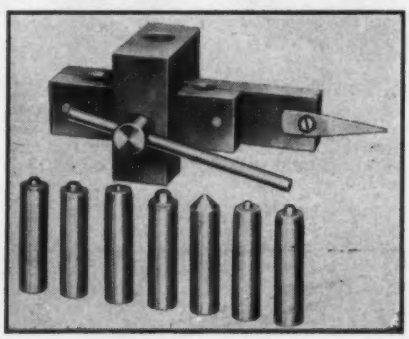
CARBIDE TOOLS—*New England Carbide Tool Co., 60 Brookline St., Cambridge, Mass.* Single-point, carbide-tipped tools are available in four styles; right- and left-hand, pointed and square tip. Aug. 5, 1943, p. 132.



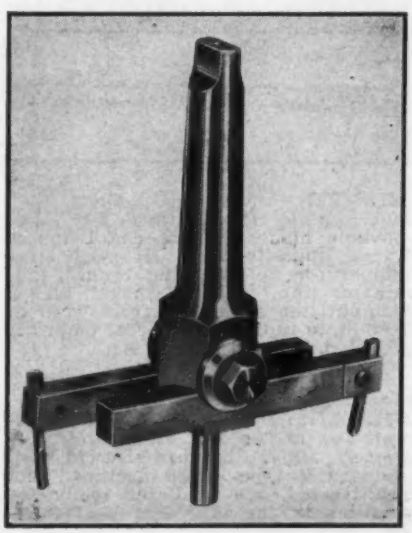
HONE—*Diamond R Agencies, Pasadena 17, Calif.* Tungsten carbide and high-speed steel tools can be resharpened with this metal bonded diamond file or hone with 100 concentration; available in three grit sizes. Dec. 23, 1943, p. 128.

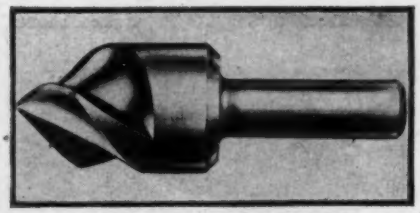
DIAMOND HONE — *Tungsten Alloy Mfg. Co., 65 Colden St., Newark 4, N. J.* Tamaloy hones for use with carbide tools are available in three grades; rough, medium and fine. Not shown. Dec. 9, 1943, p. 122.





FLARING TOOL—*Everhot Products Co., 2055-59 W. Carroll Ave., Chicago 12, Ill.* A double-lap flare on steel and non-ferrous tubing ⅛ to ⅝ in. outside diameter can be produced with the Flaremaster. Aug. 19, 1943, p. 140.





COUNTERSINK — *Schrillo Aero Tool Engineering Co., Los Angeles, Calif.* This spiral fluted countersink and counterbore permits repeated resharpening of the countersink. Apr. 15, 1943, p. 140.

COUNTERSINK LOCK — *Aero Tool Co., Burbank, Calif.* A split keeper for positive set to the retainer collar on bearings has been incorporated in the micrometer stop countersinks made by this company. Sept. 2, 1943, p. 140.

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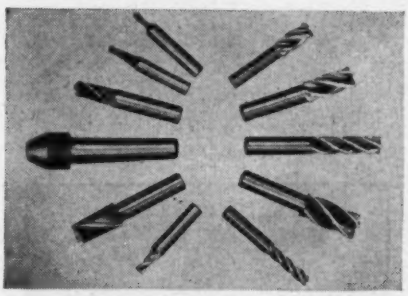
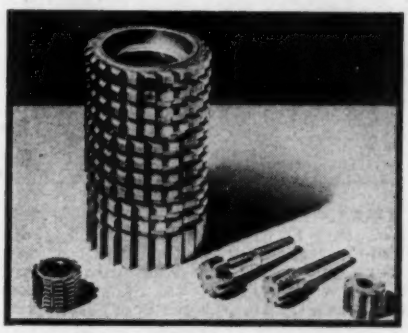
CUTOFF TOOL — *Anthony Tool Co., 233-241 Fredericksburg Rd., San Antonio, Texas.* This company makes several models of cutting off tools for engine and turret lathes in a variety of sizes. Not shown. Feb. 4, 1943, p. 128.



END MILLS—*Fray Tool & Reamer Co., 515 W. Windsor, Glendale, Calif.* Kurl Kut end mills are available in 11 styles and a wide range of sizes. Apr. 29, 1943, p. 128.



MILLING CUTTERS — *Plan-O-Mill Corp., Hazel Park, Mich.* A complete size range of multiple thread milling cutters in National, Whitworth, Acme, V, and special forms are available. July 8, 1943, p. 138.

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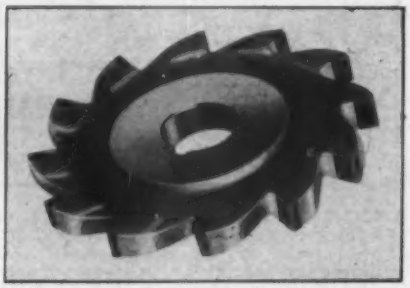
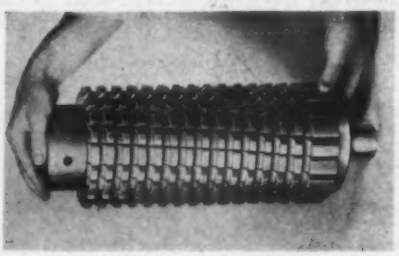
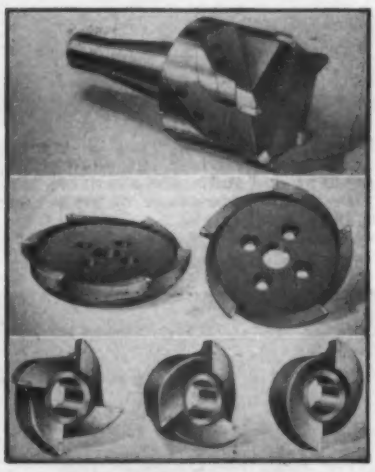
FLY CUTTER—*Robert H. Clark Co., 3434 Sunset Blvd., Los Angeles 26, Calif.* Two-blade adjustable fly cutters are suited for cutting holes or disks in metal up to 1 in. thick. Aug. 19, 1943, p. 142.



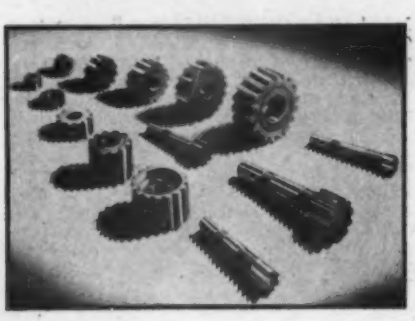
MILLING CUTTER—*Super Tool Co., 21650 Hoover Rd., Detroit, Mich.* Standard cutters from 3 to 8 in. diameter for cast iron, brass, bronze, copper, aluminum, magnesium and plastic are carbide-tipped. Aug. 5, 1943, p. 128.



MILLING CUTTER — *Plan-O-Mill Corp., 1501 E. Eight Mile Rd., Hazel Park, Mich.* For threading gun tubes, breech blocks, and other internal and external threaded parts, this cutter handles parts up to 16 in. in diameter. Oct. 28, 1943, p. 121.



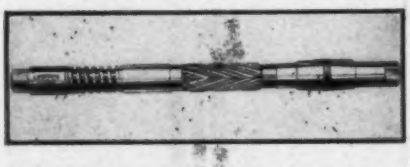
MILLING CUTTERS—*Machinery Mfg. Co., 1915 E. 51 St., Los Angeles, Calif.* Cal-Cutters, suited for milling cast iron, cold rolled steel, aluminum, are made with carbide tips in many sizes and styles. Aug. 19, 1943, p. 140.



MILLING CUTTER—*McKenna Metals Co., 103 Lloyd Ave., Latrobe, Pa.* Grayson-Kennametal milling cutters for steel and most non-ferrous metals have Meehanite bodies and are tipped with Kennametal. Aug. 5, 1943, p. 140.

CUTTER BODIES — *Farrel-Birmingham Co., Ansonia, Conn.* Milling cutter bodies are available made of Meehanite. They can be machined for carbide or cast alloy tips. Dec. 9, 1943, p. 130.

REAMERS — *Lavalle & Ide, Inc., Chicopee, Mass.* Small Hi-Speed reamers with ground straight flutes are made in diameters from 1/16 to ¼ in. July 8, 1943, p. 144.



REAMER — *Lempco Products, Inc., 5708 Dunham Rd., Bedford, Ohio.* Removable blades feature the Lempco-Evans opposite-spiral Hi-speed steel reamer for finish boring bronze, aluminum, iron, steel or nickel alloys. Straight line expansion from 0.050 to 0.080 in. in radial and chordal planes is provided. Oct. 14, 1943, p. 148.

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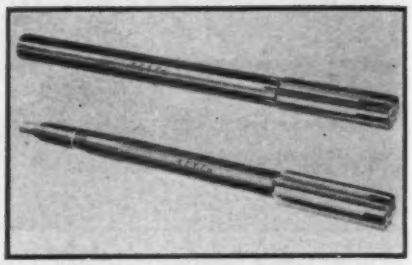
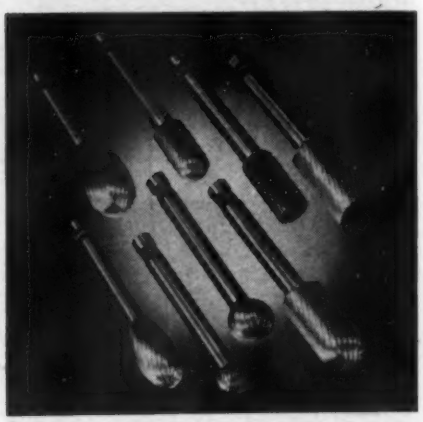
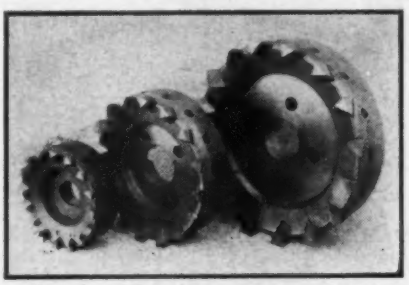
MILLING CUTTER BLANKS — *Detroit Tap & Tool Co., 8432 Butler, Detroit 11, Mich.* Standard sizes in shell and shank type, finish-machined and heat-treated, are available ready for grinding of threads. Oct. 28, 1943, p. 126.



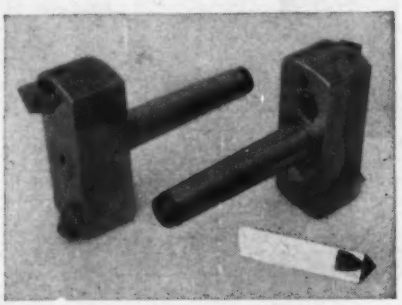
REAMER—*Tungsten Carbide Tool Co., 2661 Joy Rd., Detroit 6, Mich.* Standard sizes of this carbide tipped reamer are available in both straight and tapered shank from ¼ to 1½ in. in size. Sept. 30, 1943, p. 122.



ROTARY FILES — *Carbur, Inc., Lincoln Park 25, Mich.* Eight cemented-carbide rotary files, two sizes—⅜ and ½ in.—in four shapes are now included as standard tools. Nov. 11, 1943, p. 134.

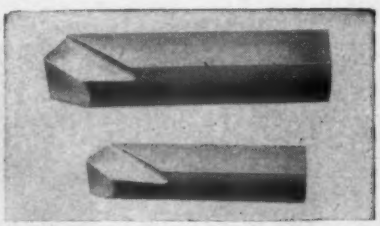


TRI-BITS—*Weddell Tools, Inc., 1239 University Ave., Rochester, N. Y.* Tri-Bit cutter blades in high speed steel, cast alloys or carbides have been applied to face milling cutters for medium, heavy, or extra-heavy duty operation. Oct. 14, 1943. p. 154.

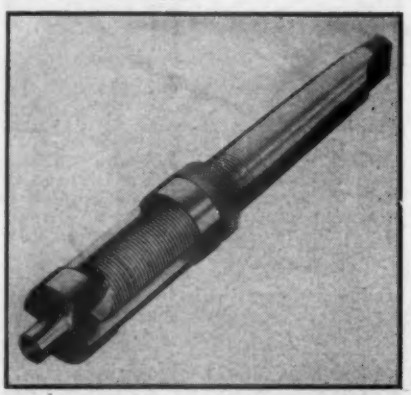


TOOLBITS—*Weddell Tools, Inc., 1239 University Ave., Rochester 7, N. Y.* Tri-Bits of high-speed steel, cast alloys or carbide tipped have been applied to fly cutters, made with one or more teeth. Nov. 25, 1943, p. 132.

STEEL SAW—*E. C. Atkins & Co., 402 S. Illinois St., Indianapolis, Ind.* For most standard milling machines, this saw is made in 3, 4, 5, 6 and 8 in. diameters. July 22, 1943, p. 140.

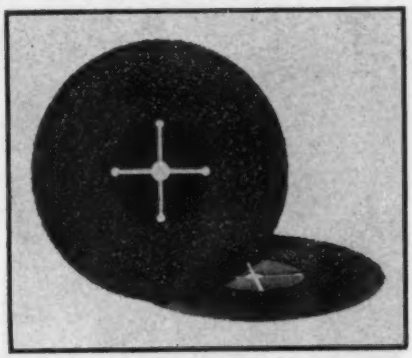


SOLID ROUND TOOLS—*Kennametal, Inc., 103 Lloyd Ave., Latrobe, Pa.* Ground ready for use in precision boring machines, the line is available in five sizes in each style, 27SR and 29SR. Oct. 28, 1943, p. 128.

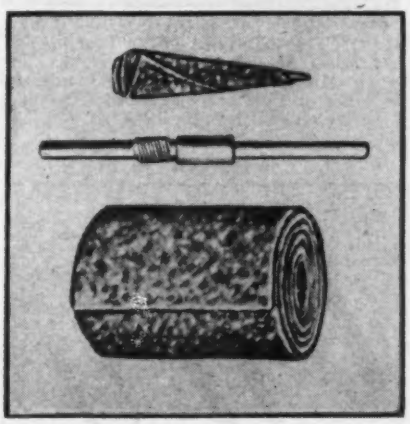


SPOT-FACER—*J. M. Nash Co., Tool Div., 2354 N. 30 St., Milwaukee, Wis.* The Nash-Zempel spot-facer and counterboring tool, available in 41 standard sizes, features removable cutter. Nov. 11, 1943, p. 132.

SPOT-FACER — *Robert H. Clark Co., 3424 Sunset Blvd., Los Angeles 26, Calif.* An adjustable blade is a feature of this tool for counterboring or spotfacing operations. It is available in sizes to cover all diameters from 9/16 to 5½ in. Dec. 23, 1943, p. 128.



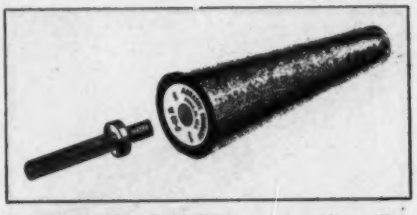
ABRASIVE DISK — *Fibre Abrasive Corp., 1129 E. 74 St., Chicago, Ill.* Marvel sanding disks, available in diameters from 6 to 26 in., and in all grits, are heat-resistant bonded. Oct. 14, 1943, p. 158.



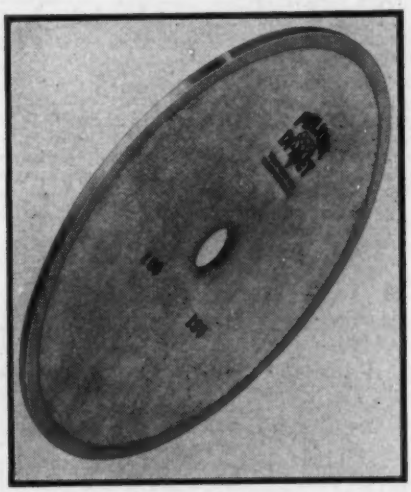
ABRASIVE WHEEL — *Flex-Abrasive Co., 100 N. LaSalle St., Chicago, Ill.* Self-dressing wheels and micropoints, suited to deburr exterior edges of alloy steels, wood, rubber and plastics also are used to cut, grind, finish and polish. July 22, 1943, p. 136.

GRINDING WHEEL — *American Emery Wheel Wks., Providence, R. I.* This wheel is suited to toolroom use in grinding hard steels. Its open construction permits air cooling and provides chip clearance. May 13, 1943, p. 138.

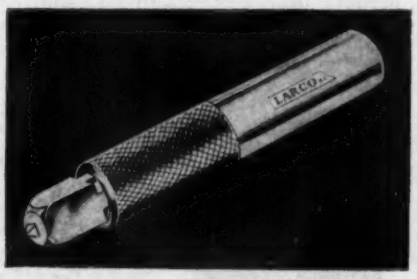
GRINDING WHEEL—*Sterling Grinding Wheel Div., Cleveland Quarries Co., Tiffin, Ohio.* This wheel is suitable for use with tungsten carbide metals, drill points, Kennametal and all kinds of steel. Mar. 18, 1943, p. 138.



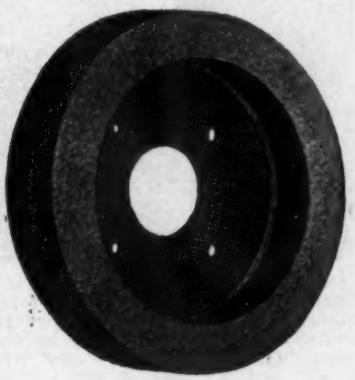
ABRASIVE POINTS — *Abrasive Co., Tacony & Fraley Sts., Philadelphia 37, Pa.* Victory points are made with demountable spindles limited to ¼ in. diameter and 1¼ in. long. Aug. 5, 1943, p. 125.



DI-MET WHEEL—*Felker Mfg. Co., Torrance, Calif.* The Di-Met wheel, made in 3, 4, and 6-in. diameters, cuts chip breaker grooves and grinds carbide tips. July 22, 1943, p. 138.

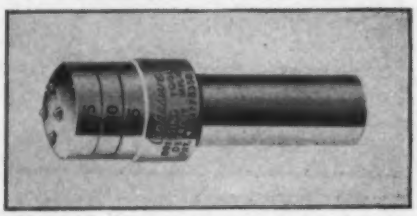


DIAMOND TOOL—*Louis A. Roselaar, Larco Tool Div., 551 Fifth Ave., New York, N. Y.* The Plus Five tool permits operator to reset the point of the diamond himself. Apr. 15, 1943, p. 140.



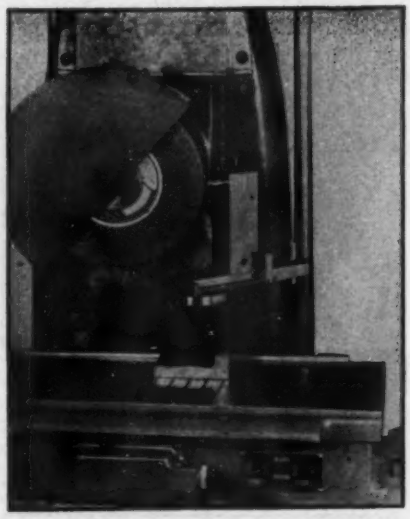
DIAMOND DRESSING TOOL—*Koebel Diamond Tool Co., 9456 Grinnell, Detroit, Mich.* Kodi fits most standard machines and eliminates necessity of a special dresser for each machine. June 24, 1943, p. 136.

DIAMOND WHEELS—*Industrial Abrasives, Inc., 3724 W. 38 St., Chicago 32, Ill.* The Super-Cut wheel includes cup and dish types. The plain periphery bonded group includes an assortment of chip breaker wheels. Not shown. Dec. 9, 1943, p. 118.

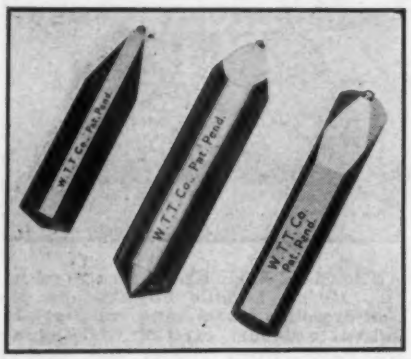


DRESSING TOOL—*Abrasive Dressing Tool Co., 1560 Broadway, Detroit, Mich.* The No. 15 Red Band tool for large external, straight face grinding wheels, has diamond numbering feature, which permits used sections to be removed to expose the next layer of diamonds. Nov. 11, 1943, p. 138.

WHEEL DRESSER—*Florian Mfg. Co., Plantsville, Conn.* Wheels of surface grinders can be dressed to required angles with this sine angle wheel dresser. Oct. 28, 1943, p. 124.

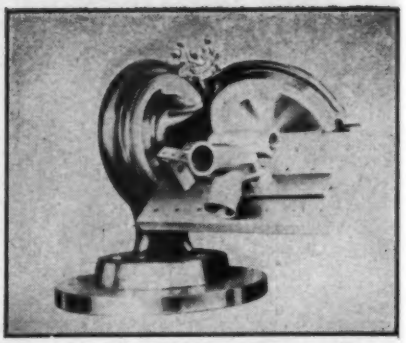


RADIUS DRESSER—*J. & S. Tool Co., 477 Main St., East Orange, N. J.* The Form-Master handles convex radii up to 4 in., and concave radii to 7 in. on a 7 in. wheel. June 10, 1943, p. 136.

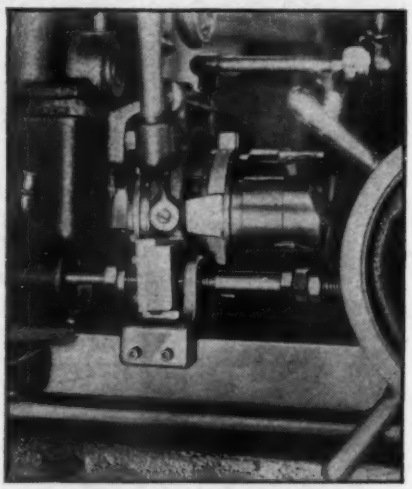


DRESSING TOOL — *Wheel Trueing Tool Co., 3200 W. Davison, Detroit, Mich.* This tool for thread grinding operations is shaped to permit angle, radial and multiple form dressing as well as straight dressing. Aug. 19, 1943, p. 140.

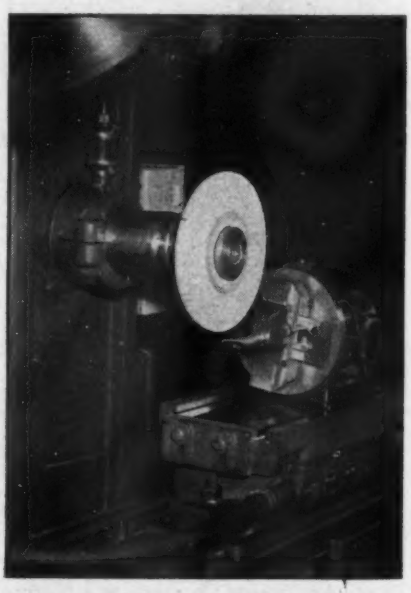
BALANCING KIT — *Pope Machinery Corp., Haverhill, Mass.* Grinding wheels up to 8 in. diameter, ¾ in. wide and 1¼ in. hole can be held in this unit. Sept. 30, 1943, p. 126.



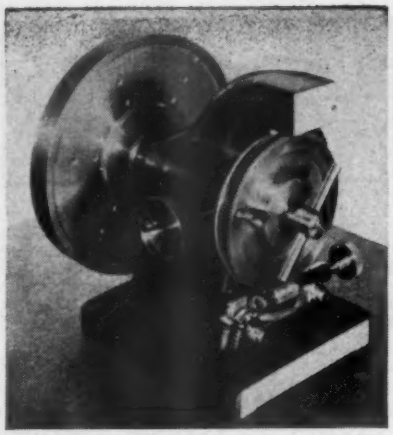
ANGLE COMPUTER—*Angle Computer Co., 5720 Melrose Ave., Los Angeles 38, Calif.* Model B Studler unit simplifies die work layout, and is suited for precision parts inspection. Aug. 5, 1943, p. 126.



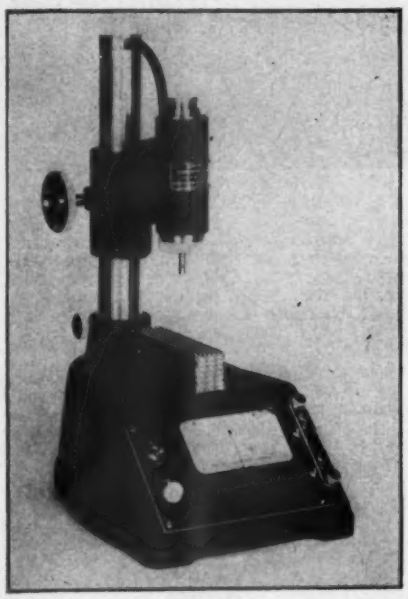
DIEHEAD DEVICE—*Landis Machine Co., Waynesboro, Pa.* The diehead of the 7V Lanco head can be applied to the ⅞ in. single or double head threading machine for quick-opening. July 8, 1943, p. 133.



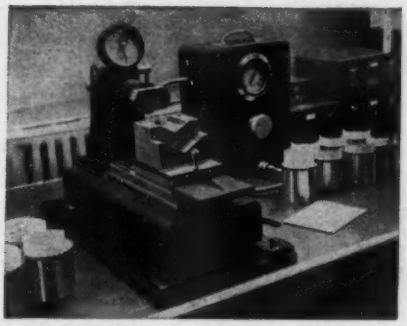
RADIUS DRESSER—*Perfex Gage & Tool Co., Detroit, Mich.* This is a horizontal type angle to tangent dresser which dresses wheel at the bottom. Apr. 29, 1943, p. 122.



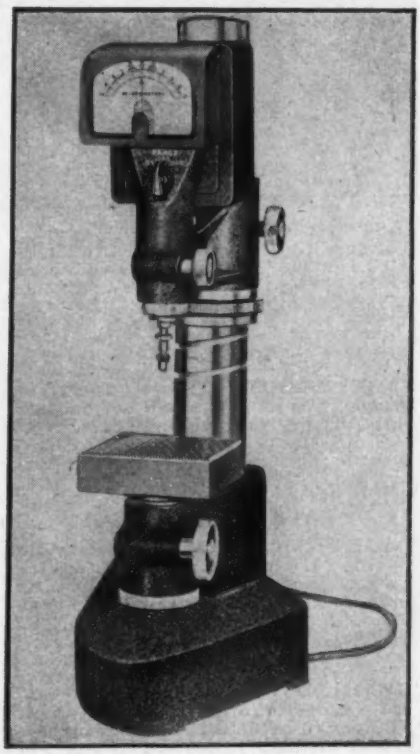
ANGLE COMPUTER—*Angle Computer Co., 5720 Melrose Ave., Los Angeles 38, Calif.* Two working positions are provided in the Model C Studler unit. Dec. 9, 1943, p. 120.



COMPARATOR GAGE—*Metron Instrument Co., 432 Lincoln St., Denver, Colo.* This is a four-range electric unit for selective sorting, measuring taper, and out-of-roundness. Apr. 15, 1943, p. 136.



GAGE—*Pratt & Whitney Div., Niles-Bement-Pond Co., W. Hartford, Conn.* The Air-O-Limit bearing gage checks inside diameters for errors in straightness, roundness, and size. Oct. 14, 1943, p. 145.



GAGE—*Televiso Products, Inc., 6533 N. Olmsted Ave., Chicago, Ill.* Three ranges can be selected on this Micrometron gage for comparison measurements. Can be made to indicate differences as low as 0.00002 in. Apr. 1, 1943, p. 118.

COMPARATOR—*Sheffield Corp., Dayton, Ohio.* Inside and outside dimensions can be checked with this instrument, suited for checking master and working ring gages, for setting snap and length gages and similar precision work. Oct. 28, 1943, p. 126.

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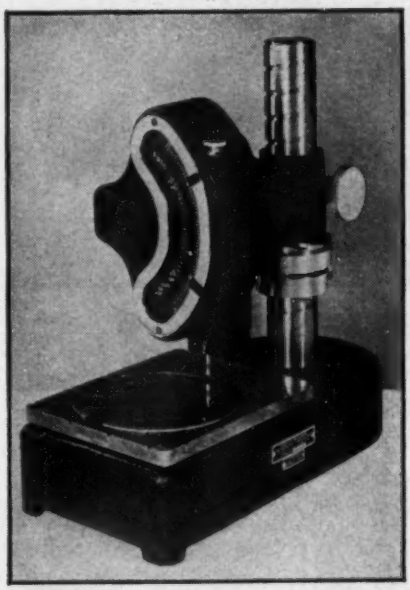
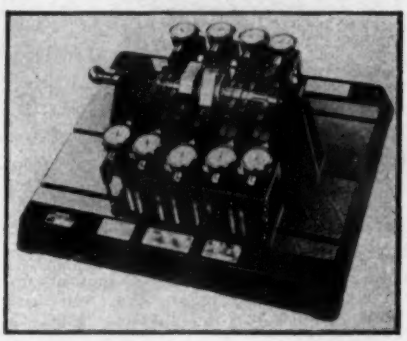
ALLOY—*Tungsten Alloy Mfg. Co., Newark, N. J.* Speedaloy is available in solid toolbits, flats and in a variety of tipped tools. It is a cast tungsten-chromium-cobalt alloy that machines all materials except manganese steel and chilled iron. Not shown. Nov. 11, 1943, p. 134.

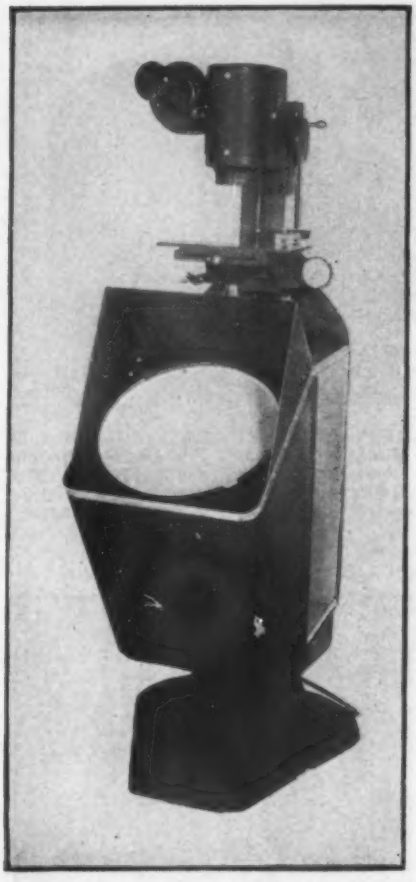
OPTICAL COMPARATOR—*Portman Machine Tool Co., 17 and 19 Beechwood Ave., Mt. Vernon, N. Y.* The Model P-3 comparator is designed to project large images for parts inspection. Mar. 18, 1943, p. 128.



COMPARATOR—*American Measuring Instruments Corp., 240 W. 40 St., New York, N. Y.* The Amic comparator is used for measuring large parts. July 8, 1943, p. 144.



GAGES—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Mechanical operation features the three models of multiple inspection gages for checking parts simultaneously, requiring no electrical connections. July 8, 1943, p. 140.



COMPARATOR — *Portman Machine Tool Co., 70 Mill Rd., New Rochelle, N. Y.* The P2-14 model has greater mechanical capacity and larger dial faces on indicators than the company's previous models. Nov. 11, 1943, p. 136.

GAGE—*Sheffield Corp., Dayton 1, Ohio.* The Electrichek provides bench type production inspection for checking close tolerances by lights. Sept. 30, 1943, p. 116.

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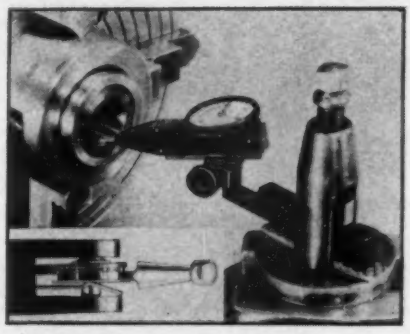
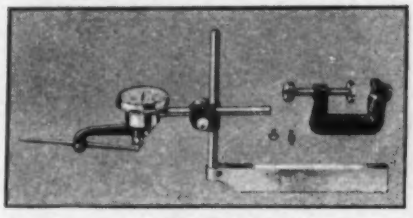
LEADCHEK—*Sheffield Corp., Dayton 1, Ohio.* Threads as fine as 40 pitch or as coarse as 2¼ threads per in. can be checked on parts from 0.125 to 2 in. in diameter. Dec. 9, 1943, p. 124.



DIAL INDICATOR—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* Testmaster indicator features a ratchet index point which locks in place. Aug. 5, 1943, p. 132.



TEST INDICATOR—*B. C. Ames Co., Waltham, Mass.* The No. 22A indicator is suited for use on conventional testing jobs, and with hole attachment will reach internal surfaces difficult to get at. Feb. 18, 1943, p. 140.

GAGE BLOCKS—*Savage Tool Co., Savage, Minn.* This Doall set consists of 81 blocks ranging in length from 0.050 to 4 in. and is produced in three accuracy grades. Not shown. Feb. 18, 1943, p. 148.

GAGE BLOCKS—*Lincoln Park Tool & Gage Co., Lincoln Park 25, Mich.* Carblox gages, made of carbide, come in a 14-block set for build-up or individual use. Not shown. Nov. 11, 1943, p. 138.

GEAR TESTER—*George Scherr Co., 128 Lafayette St., New York, N. Y.* Faults can be detected during process; center distance range is 1 to 6 in. Special attachments available for smaller checking. Oct. 28, 1943, p. 132.

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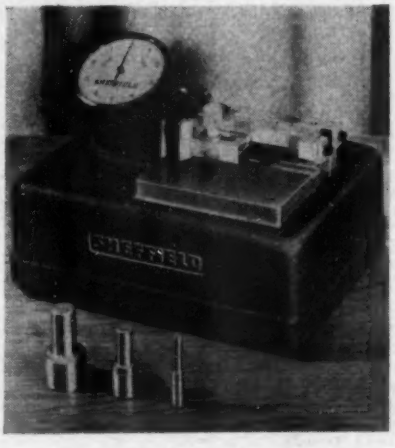
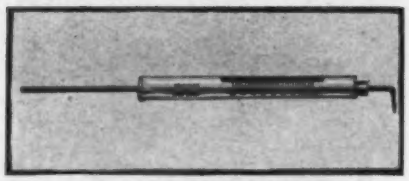
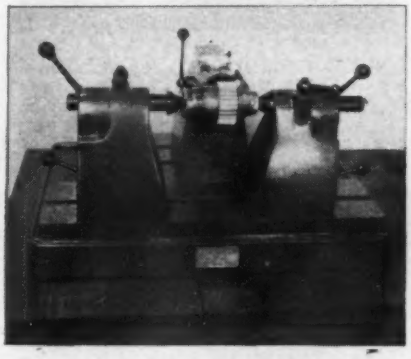
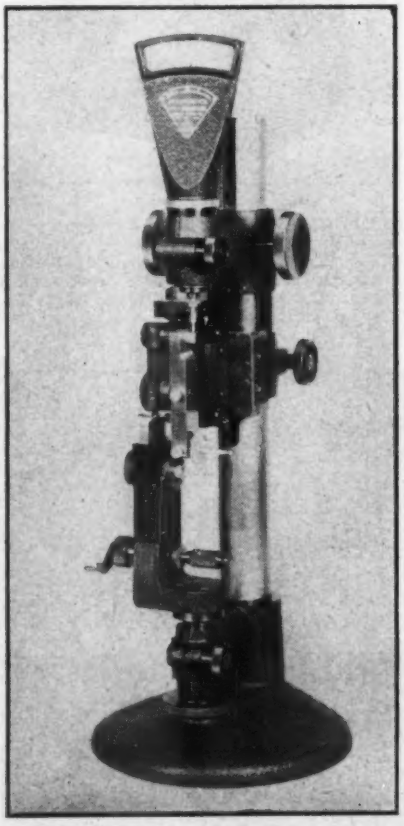


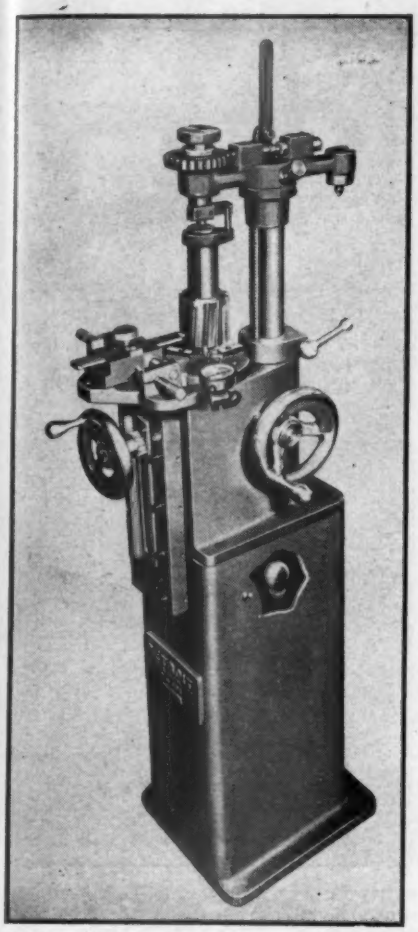


GAGE—*John Chatillon & Sons, 85-93 Cliff St., New York, N. Y.* Uses for this push-pull gage include measurement of tensions, pressures, mechanical reactions, breaking strains, other forces of from ½ gram to 100 lb. June 10, 1943, p. 128.

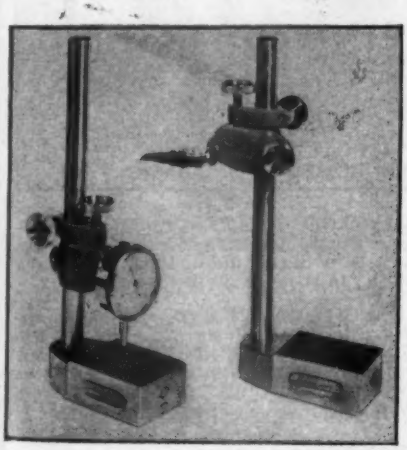


GEAR CHECKING FIXTURES—*Fellows Gear Shaper Co., Springfield, Vt.* This company has introduced a cone-pointed fixture for testing concentricity of gear pitch circle, and another fixture for checking circular pitch or tooth to tooth spacing on gears up to 12 in. pitch dia. Mar. 18, 1943, p. 128.



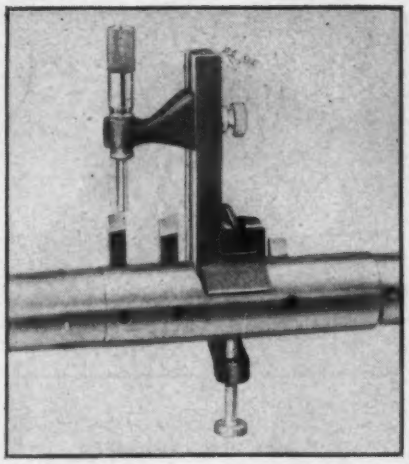


HOOK CHECKER — *Detroit Tap & Tool Co., 8432 Butler Ave., Detroit 11, Mich.* For checking hook or rake and flute spacing in sharpening thread milling cutters, this machine handles both shell and shank type cutters. Sept. 30, 1943, p. 122.



HEIGHT GAGE — *H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass.* This is a rigid gage and comparator which can be set to half a tenth. Apr. 1, 1943, p. 126.

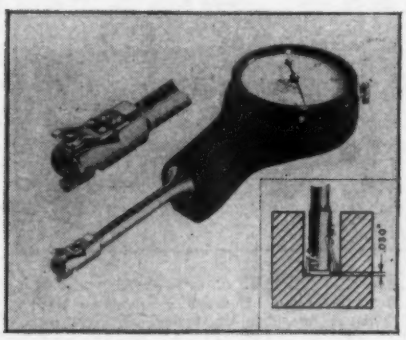
HEIGHT GAGE—*Jansson Gage Co., 19208 Glendale Ave., Detroit, Mich.* Three sizes of this vernier height gage, 12, 18 and 24 in., with English or metric measures are available. Not shown. Apr. 1, 1943, p. 124.



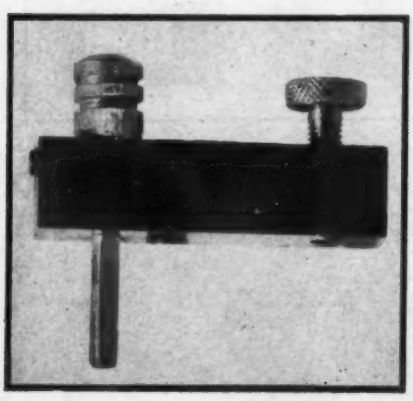
MICROMETER — *Bartelt Engineering Co., 1412 Partridge Ave., Beloit, Wis.* The Model B is designed for setting closely spaced boring tools; serves many other gaging uses. July 22, 1943, p. 134.

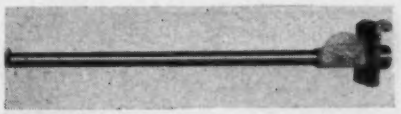
MICROMETER—*George Scherr Co., 128 Lafayette St., New York 13, N. Y.* Reed micrometers in 1, 2, and 3 in. sizes are being furnished with vernier reading to 0.0001 in. Not shown. Nov. 11, 1943, p. 140.

MAGNETIC ADAPTER—*Windermere Mfg. Co., 205 E. 42 St., New York, N. Y.* The unit is suited for dial test indicators, gage block applications and surface gages. Not shown. Apr. 15, 1943, p. 136.

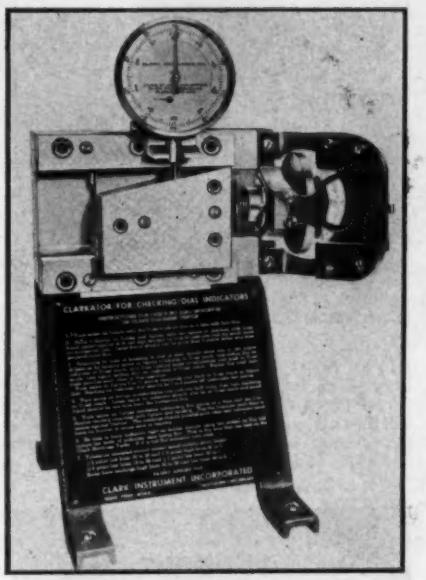


BLIND HOLE GAGE—*Federal Products Corp., 1144 Eddy St., Providence, R. I.* This instrument inspects holes of all sizes from ½ in. diameter up, and of various lengths. Oct. 28, 1943, p. 136.

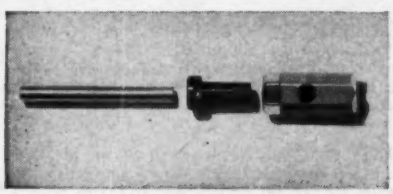




INDICATOR—*Lehmann Machine Co., Chouteau & Grand Blvd., St. Louis 3, Mo.* The Tell-Tale deep hole indicator is suited for general-purpose hole inspection; for 3 in. diameter or larger holes. Sept. 16, 1943, p. 126.



INDICATOR CHECKER — *Clark Instrument Inc., 10200 Ford Rd., Dearborn, Mich.* The Clarkator, for checking accuracy of dial indicators, employs the sine bar principle, checking against the tangent of the angle. Oct. 14, 1943, p. 160.



PLUG GAGE—*Turner Gage Grinding Co., Ferndale, Mich.* The Plast-O-Lock utilizes plastic for the collets which are slotted and tapered to fit a standard gage holder. Available in plug sizes from 0.050 to 0.690 in. Dec. 23, 1943, p. 132.

PLUG GAGE — *Sav-Way Industries, 4873 E. Eight Mile Rd., Detroit, Mich.* The Master Set of standard gages for hole inspecting includes 147 plugs and four handles. Sizes of plugs range from ¼ to 1 in., with three plugs of each size furnished, one 0.0005 in. over, one standard and the other 0.0005 in. under. Not shown. Sept. 2, 1943, p. 134.

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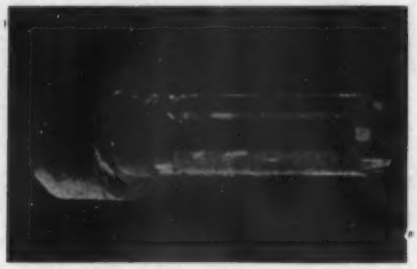
DEPTH GAGE—*Beale & Arnold Mfg. Co., 111-115 Glenwood Ave., Minneapolis, Minn.* The Gauge-Master is used with a 2-in. micrometer caliper to determine depths formerly taken with a depth micrometer. June 24, 1943, p. 138.

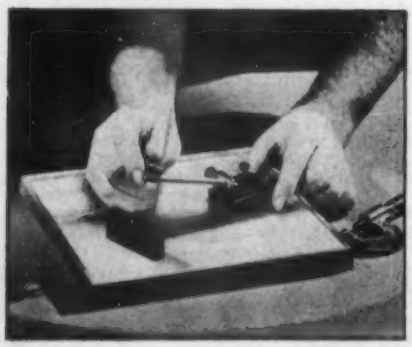
PIPE GAGE—*Three-Point Gage Co., 3821 Broadway, Chicago, Ill.* Pipe from ⅛ to 12 in. diameter can be measured with this steel gage which permits measurement in any position. Oct. 28, 1943, p. 136.

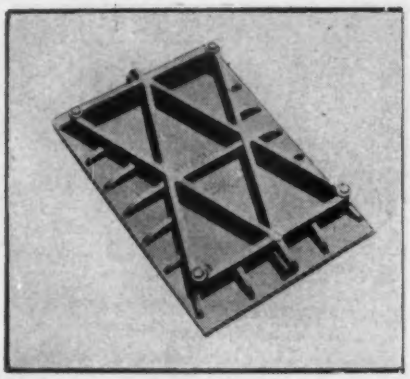


GLASS PLUG GAGE—*Turner Gauge Grinding Co., Ferndale, Mich.* This line of gages ranges in size from ⅜ to 2¼ in. diameter, have same tolerances as those of steel. May 13, 1943, p. 144.

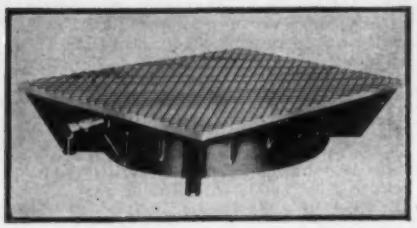
SNAP GAGE—*Greenfield Tap & Die Corp., Greenfield, Mass.* An extended lower anvil is provided in this snap gage to facilitate inspection. Not shown. Sept. 16, 1943, p. 140.

SNAP GAGE — *Phoenix Gage Co., Phoenix, N. Y.* Feature of this adjustable limit snap gage is a double cone lock plug. Not shown. Aug. 19, 1943, p. 134.

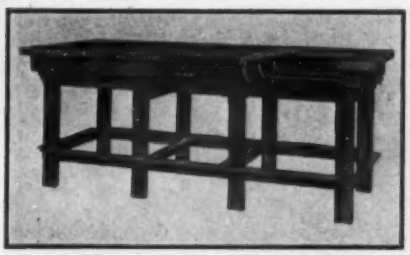




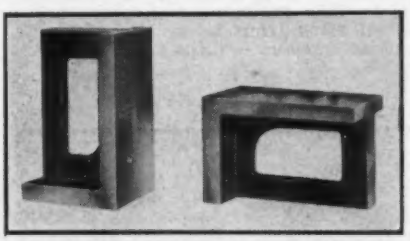
SURFACE PLATE—*Stewart Co., 967 Farmington Ave., W. Hartford, Conn.* This unit features adjustable feet; available in sizes 10x15 and 12x18 in. Aug. 5, 1943, p. 136.



LAPPING PLATE—*Smith Tool & Engineering Co., 802 N. Sandusky Ave., Bucyrus, Ohio.* Size ranges of this unit are from 8x12 in. to 48x120 with the elliptical rib construction for maximum rigidity and minimum deflection. Apr. 15, 1943, p. 138.



LAYOUT PLATE — *Challenge Machinery Co., Grand Haven, Mich.* Clamp edges are provided on this plate for layout, inspection or assembly work. Aug. 5, 1943, p. 132.



ANGLE IRON—*Challenge Machinery Co., Grand Haven, Mich.* Four sizes ranging from 4 to 8, 5 to 10 and 3¾ to 5½ in. on each side are available in this universal right-angle iron. Aug. 19, 1943, p. 138.

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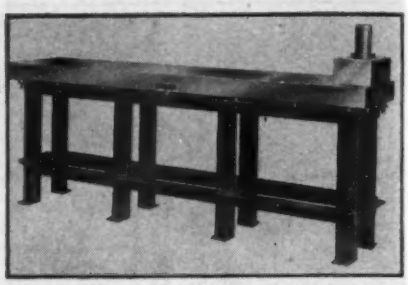
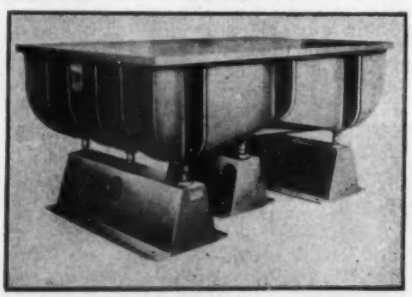
GLASS SURFACE PLATE—*Cadillac Glass Co., 920 W. Cermak Rd., Chicago, Ill.* Available in seven sizes ranging from 8x8 to 18x18 in. July 22, 1943, p. 132.



SURFACE PLATE — *Challenge Machinery Co., Grand Haven, Mich.* This long layout surface plate is equipped with special V-Blocks. Aug. 19, 1943, p. 142.

SURFACE PLATE—*Thomas Wilberton & Co., Cedar Grove, N. J.* This is a combination surface-angle plate made in bench or floor models. Apr. 15, 1943, p. 134.



SURFACE PLATE—*Machine Products Corp., Detroit, Mich.* This is an unusually large plate, built for heavy work loads. Apr. 29, 1943, p. 130.

INSPECTION LIGHT—*Curtis Lighting, Inc., 6135 W. 65 St., Chicago, Ill.* This is essentially a magnifying lens with auxiliary lighting which holds two 6 watt lamps. Not shown. July 8, p. 138.

INSPECTION UNIT—*S. Lowe & Sons Co., 20 Sanford St., Fairfield, Conn.* The Inspecto-Graph is a portable unit and the Inspecto-Scope does continuous production inspection. Both have adjustable arms. Not shown. Mar. 18, 1943, p. 132.

INSPECTOGRAPH—*S. Lowe & Sons Co., 30 Sanford St., Fairfield, Conn.* The No. 5 device is designed for inspecting work up to 6 in. in size for minute scratches, burrs and other defects. Not shown. Oct. 28, 1943, p. 124.

WEBBER ANGLE GAGE BLOCKS

WHAT THEY ARE: An entirely *new* tool for the precision measurement of angles in the laboratory — inspection room or shop. A set consists of 14 angle blocks which will give you any angle from 0° to 130° — a total of 370,800 angles in steps of 1 second of an arc.

How they are used: Blocks of proper size are selected from the set and wrung together just like regular parallel gage blocks to obtain any desired angle.

SIMPLE AND EASY TO USE —

It requires very little study to understand how two or more Angle Gage Blocks may be wrung together to obtain any angle desired in degrees, minutes and seconds. No mathematical computation is involved in using Webber Angle Gage Blocks. With each set is furnished a table showing which blocks to use and how to combine them to get any angle required. Webber Angle Gages are a great improvement over old methods of angle measurement reducing this operation to an extremely simple, fast, absolutely accurate procedure.

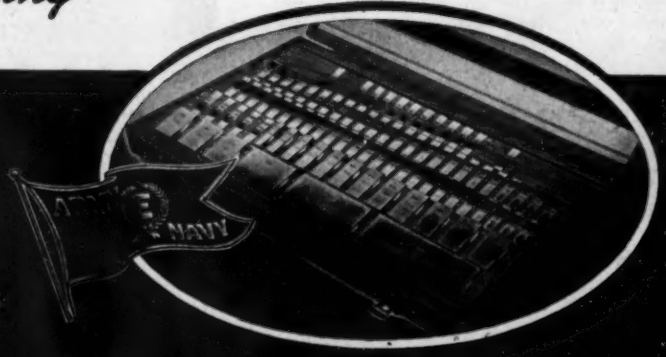
Webber Angle Gage Blocks are a true division of a circle.

Webber Angle Gage Blocks are furnished in sets of 14 blocks, 3 series:

1st series 1 — 3 — 9 — 15 — 30 — 45 degrees
2nd series 1 — 3 — 9 — 27 minutes
3rd series 1 — 3 — 9 — 27 seconds

Write for new Angle Gage Bulletin giving full details and instructions as to use.

A Milestone in Measuring



Webber
GAGE COMPANY

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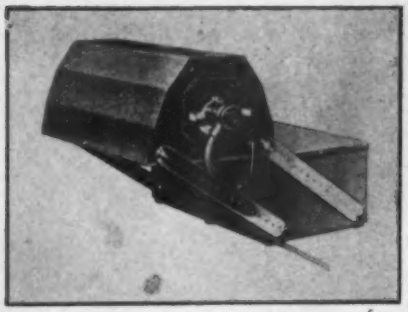


INSPECTION LIGHT — *George W. Gates & Co., Franklin Sq., Long Island, N. Y.* Close measurement is permitted with this unit which uses true monochromatic light source. Aug. 5, 1943, p. 136.

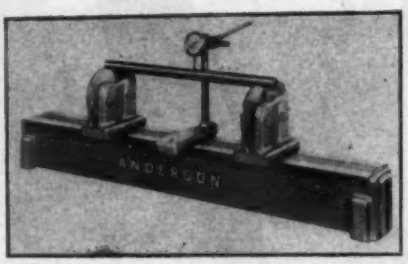
ILLUMINATOR, INSPECTION UNITS—*Acro Tool & Die Works, 4892 N. Clark St., Chicago, Ill.* Parts of machine can be illuminated from any desired angle with this device, available in several types. Inspection units include illuminating magnifiers. Not shown. Apr. 1, 1943, p. 120.

MAGNIFYING MIRROR — *Larrimore Sales Co., P.O. Box 1234, St. Louis 1, Mo.* An operation or dial at a point not readily visible can be watched; over-all head size is 7½ in. Not shown. Dec. 23, 1943, p. 128.

PROJECTOR—*George Scherr Co., 128 Lafayette St., New York 13, N. Y.* This unit is available with two-inch diameter condenser. Lenses can be furnished 1⅜ or 3/16 in. in diameter. Sept. 16, 1943, p. 126.

CHECKING INSTRUMENT — *Larrimore Sales Co., P.O. Box 1234, St. Louis 1, Mo.* The Inspector unit combines two-tube fluorescent "daylighting" with single or double 5-in. magnifying lens for checking and inspection use. Not shown. June 10, 1943, p. 130.

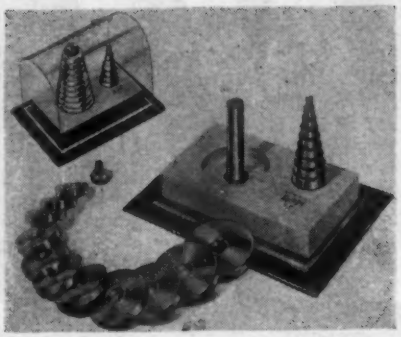
HARDNESS TESTER—*Clark Instrument, Inc., 10300 Ford Rd., Dearborn, Mich.* Rockwell testing on B and C scales and most other Rockwell scales can be performed on this instrument. Not shown. July 22, 1943, p. 134.



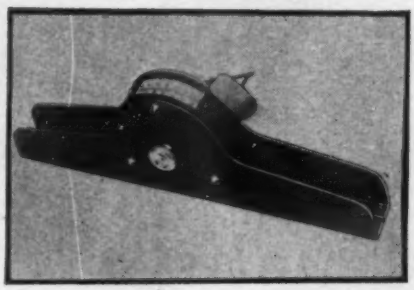
ROTO-CHECKER — *Anderson Bros. Mfg. Co., 1907 Kishwaukee St., Rockford, Ill.* This equipment checks straight shafting, tubing or pieces having the same diameter at both ends. Mar. 18, 1943, p. 136.

RECORDER—*Michigan Tool Co., 7171 East McNichols Road, Detroit, Mich.* The Model B makes permanent chart records of involute tooth forms and leads, and has various other checking uses. Apr. 29, 1943, p. 120.

WEAR GAGE—*American Instrument Co., 8010-8020 Georgia Ave., Silver Springs, Md.* The McKee wear gage measures amount of material removed from metallic surfaces after being subjected to wear, abrasion, honing, lapping. Wear as low as 0.000015 in. can be detected. Mar. 4, 1943, p. 130.



CHECKING ROLLS—*Sav-Way Industries, 4873 E. Eight Mile Rd., Detroit 13, Mich.* The set consists of 20 rolls for checking micrometers and other gaging instruments. Dec. 9, 1943, p. 124.

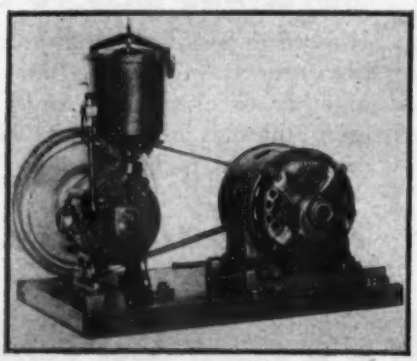


CLINOMETER—*Engis Equipment Co., 310 S. Michigan Ave., Chicago, Ill.* This device is suited for checking angles and inclinations, such as for use on machine tools and test set-ups in the inspection room. May 27, 1943, p. 140.

MEASURING DEVICE—*Taber Instrument Corp., N. Tonawanda, N. Y.* This shear-hardness attachment measures toughness quality of surface finishes such as paint. Not shown. May 27, 1943, p. 134.

SPRING TESTER—*P. A. Sturtevant Co., Addison, Ill.* This tool tests compression springs in sizes to 2½ in. diameter and 7 in. long. Not shown. May 27, 1943, p. 144.

TEST JIG — *Baldwin Locomotive Works, Philadelphia, Pa.* This jig tests yield strength in sheet metal in single thickness, rather than in packs. Not shown. May 13, 1943, p. 148.



TESTING UNIT—*Leiman Bros. Inc., 136 Christie St., Newark, N. J.* This is a vacuum-creating outfit for testing delicate instruments. Apr. 1, 1943, p. 114.

DOING TOUGH JOBS *Fast*

takes the Speed and Stamina of

SKILSAW TOOLS!

EVERY MAN
COUNTS FOR MORE
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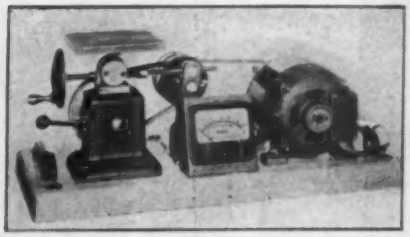
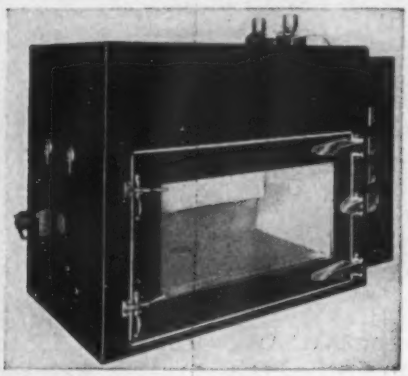
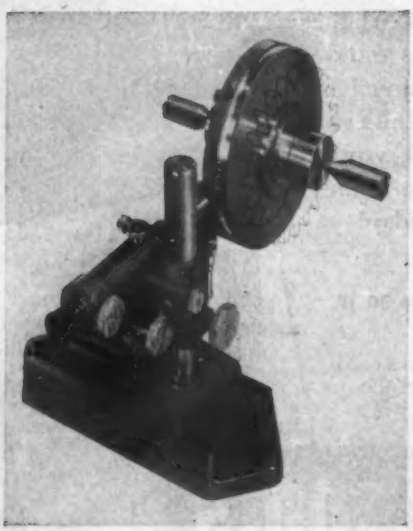


TESTING MACHINE—*All American Tool & Machine Co., 1014 Fullerton Ave., Chicago, Ill.* This portable Vibrotron does vibration testing of articles up to 10 lb. Feb. 4, 1943, p. 122.

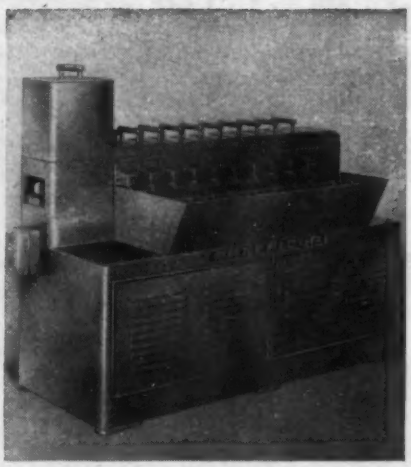
GLOSSMETER—*Photovolt Corp., 95 Madison Ave., New York, N. Y.* Surface finish readings of a machined or polished surface can be obtained with this photo-electric glossmeter. Not shown. Apr. 15, 1943, p. 144.



INSTRUMENT TESTER—*American Coils, Inc., Newark, N. J.* This is a chamber for testing instruments under extremes of cold and heat, with range of operating temperatures from minus 55 C. to plus 70 C. Mar. 4, 1943, p. 128.



TESTER—*Engis Equipment Co., 310 S. Michigan Ave., Chicago, Ill.* Spacings in gears, camshafts, splined shafts or index plates can be checked with this circular division tester. Sept. 30, 1943, p. 114.



INSPECTION MACHINE—*Sheffield Corp., Dayton, Ohio.* This machine checks and sorts ball bearings ranging from ⅛ to 11/16 in. in diameter, at rate of 15,000 to 20,000 per hr. Sept. 16, 1943, p. 134.

CYCLOGRAPH—*Allen B. Du Mont Laboratories, Inc., 2 Main Ave., Passaic, N. J.* The instrument checks, sorts, and analyzes metallic materials and alloys by electronic means. Not shown. Nov. 11, 1943, p. 125.

ELECTRONIC UNIT—*North American Philips Co., Industrial Electronics Div., Pershing Sq. Bldg., New York, N. Y.* The Searchray is used for internal inspection of small parts, molds, castings of light alloys, plastics and rubber. Not shown. Sept. 16, 1943, p. 140.

HYDRAULIC TEST BENCH—*Hydraulic Machinery Co., 10421 Grand River, Detroit, Mich.* This is a stationary test bench suited for checking aircraft tubing. Not shown. Apr. 15, 1943, p. 132.

SPARK PLUG TESTER—*Denison Engineering Co., Columbus, Ohio.* This is used in testing the firing precision of aircraft spark plugs and has air pressure up to 750 lb. per sq.in. Not shown. Jan. 7, 1943, p. 124.

TEST BENCH—*Hydraulic Machinery Co., Inc., Dearborn, Mich.* Two models are available, one for testing short lengths of hose, tubing and cylinders; the other for testing most equipment in the field of hydraulics. Not shown. Dec. 23, 1943, p. 126.

PROFILOMETER — *Physicists Research Co., 364 S. Main St., Ann Arbor, Mich.* Type Q is portable and measures surface roughness by direct dial readings. Not shown. Sept. 30, 1943, p. 128.

TEST BENCH—*R. Voigt & Son Co., 1060 Military Rd., Buffalo, N. Y.* This hydraulic test bench is suited for testing hydraulically operated devices; working surface 3x5 ft. Not shown. Apr. 29, 1943, p. 130.

TEST STAND—*Airplane Mfg. & Supply Corp., 6853 Lankershim Blvd., N. Hollywood, Calif.* The Amsco starter tester is available in either battery or rectifier model. Not shown. Nov. 11, 1943, p. 128.

RIVET BUCKER—*Aero Tool Co., Burbank, Calif.* This bench model is automatic and bucks and rivets in one operation. Apr. 29, 1943, p. 122.

PNEUMATIC TOOLS—*Aro Equipment Corp., Bryan, Ohio.* Two portable pneumatic tools for 2 in. wheel capacity, one with button throttle control, and the other with lever throttle control, have been developed for grinding and cleaning of casings. Oct. 14, 1943, p. 156.

TESTING MACHINE—*V. L. Graf Co., 8825 Grinnell Ave., Detroit, Mich.* This hydrostatic machine tests castings or other components, for soundness, porosity or adequate bursting strength. Not shown. Feb. 18, 1943, p. 142.

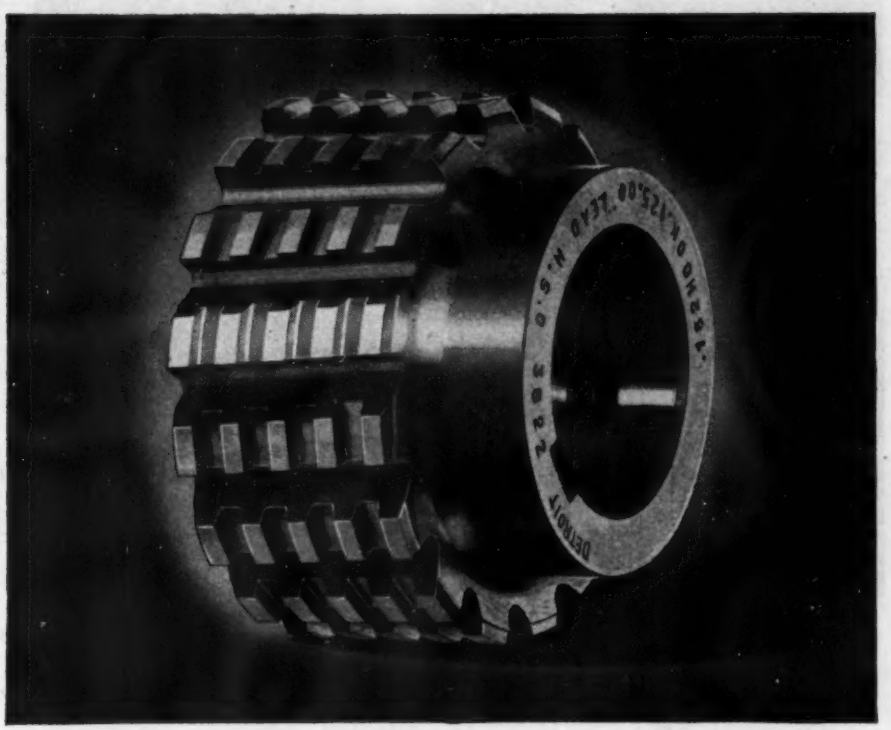
TEST STAND—*Denison Engineering Co., W. Chestnut St., Columbus, Ohio.* This portable unit tests hydraulic systems of airplanes and component parts, including valves and lines of aircraft operating on pressures up to and including 3,000 lb. per sq.in. Not shown. Apr. 15, 1943, p. 138.

FLAW DETECTOR—*General Electric Co., Special Products Div., Schenectady, N. Y.* Longitudinal cracks and seams in non-magnetic metallic tubing can be detected with this instrument; imperfections ½ in. long, 10 mils wide, and one-third of the wall thickness in depth can be located. Nov. 25, 1943, p. 130.

WAR-TIME SHOP RECIPES

"NAZIS FEAR U.S. ARTILLERY MOST"

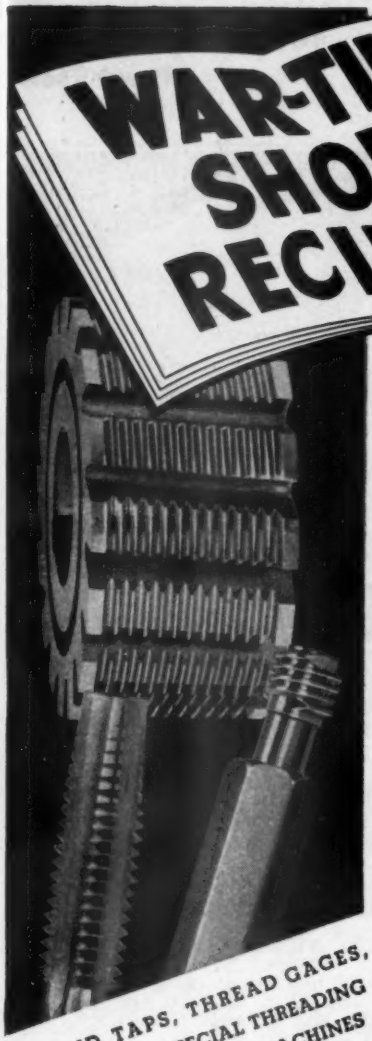
(News Headline)



It may seem like a far cry from the breech block thread milling cutter pictured above to a barrage by U. S. heavy artillery. But one reason the Nazis fear our heavy guns is their ability to keep pounding away round after round. To do that, the breech blocks of these heavy guns have to "stay put" better. Despite the tremendous shocks they have to take, the interrupted Acme threads in these blocks provide quick, easy and positive breech action.

"Detroit" thread milling cutters used to produce these threads are unusually accurate. That's one reason why breech block threads made with them can take so much pounding and why, when necessary, breech blocks can be replaced so quickly in the "field".

Detroit Tap, in addition to such special cutters, also offers for the first time a line of standardized thread mills. Ask for Bulletin CB-43.



GROUND TAPS, THREAD GAGES, THREAD HOBS & SPECIAL THREADING TOOLS. SPECIAL TAPPING MACHINES

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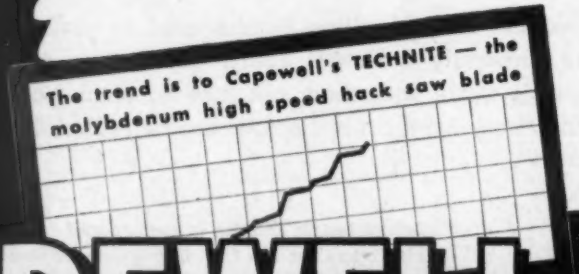
Capewell
HACK SAW BLADES
Cut Time FOR
TOOL MANUFACTURER
DOING WAR WORK

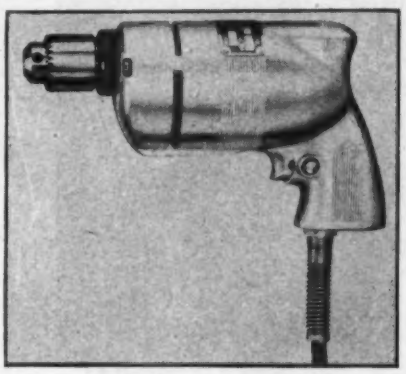
This manufacturer had difficulty finding a blade that would take the punishment of his high-speed production — six pieces of 3½" steel stock at a cut, 135 strokes. Then Capewell's Technite hack saw blade was tested. The result: orders and repeat orders. Have you investigated Capewell hack saw blades?

The Capewell Mfg. Co., Hartford, 2, Conn.



CAPEWELL
HACK SAW BLADES

PNEUMATIC DRILL—*Ingersoll-Rand Co., 11 Broadway, New York, N. Y.* The size OOA drill is light in weight, powered by air motor and has a built-in speed regulator. Jan. 7, 1943, p. 120.

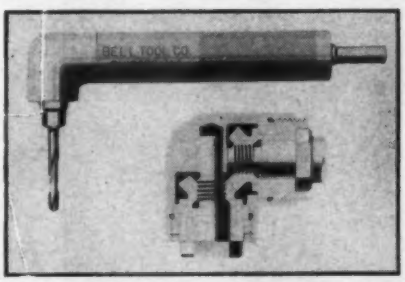


DRILL—*Skilsaw, Inc., 5033-43 Elston Ave., Chicago, Ill.* The heavy-duty Skildrill handles work up to ¼ in. in steel and ½ in. in wood and has four speeds. May 13, 1943, p. 148.

ELECTRIC DRILL—*Black & Decker Mfg. Co., Towson, Md.* Drillite plastic housing has been developed for the ¼ and ⅜ in. drills. Not shown. May 27, 1943, p. 144.

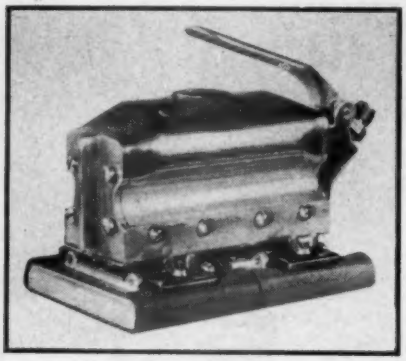
HAND TOOL—*Precise Products Co., 1328-30 Clark St., Racine, Wis.* The Precise-35 electric hand tool and Coolflex flexible shaft attachment does fast cutting on non-ferrous materials. Not shown. June 24, 1943, p. 134.

PORTABLE DRILL — *Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.* A Thorite plastic housing is the feature of this portable electric ¼-in. drill. Not shown. Apr. 1, 1943, p. 122.

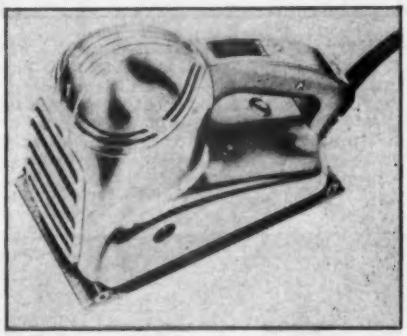


ANGLE HEAD—*Bell Tool Co., 710 W. Jackson Blvd., Chicago 6, Ill.* The B-90 leg. angle head tool is suited for use with small portable tool or flexible shaft tools. Oct. 28, 1943, p. 130.

TOOLS and ACCESSORIES — Power Tools

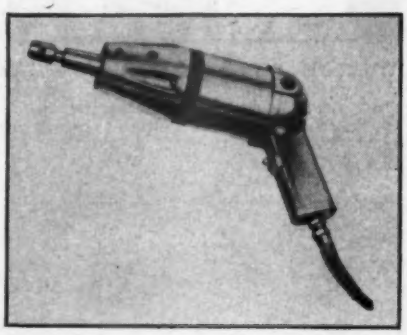


SANDER—*Sundstrand Machine Tool Co., Rockford, Ill.* Model 1,000 Hi-Speed pneumatic sander is suited for hand sanding and finishing operations. Oct. 14, 1943, p. 152.



ELECTRIC SANDER—*Sterling Tool Products Co., 363 E. Ohio St., Chicago, Ill.* The Sterling 1000 portable sander has a detachable sanding pad, equipped with snap-action switch. Mar. 4, 1943, p. 132.

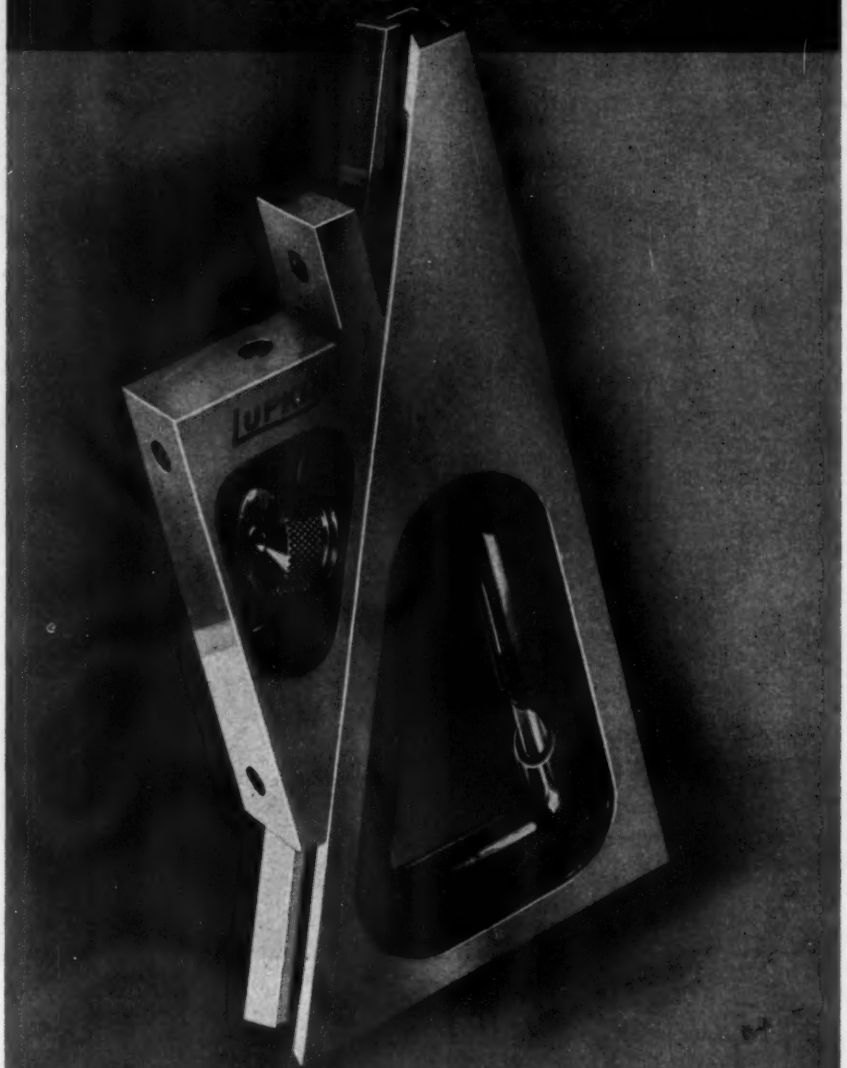
FLEXIBLE SHAFT MACHINE—*Wyzenbeek & Staff, Inc., 838-842 W. Hubbard St., Chicago, Ill.* The WYCO radial type machine is handy wherever floor or bench machines are inconvenient. It is available in several sizes. Not shown. Mar. 18, 1943, p. 130.



BURRING TOOL—*H & H Research Co., 433 Marquette Bldg., Detroit, Mich.* Uses for this tool made in two models include filing, burring, polishing and lapping, sawing and sanding. Available in two sizes. June 10, 1943, p. 128.

DRILL—*Aro Equipment Corp., Bryan, Ohio.* This pneumatic drill with plastic case accommodates ⅛, 3/16, ¼, or 5/16 in. drills, with Jacobs chuck. Not shown. Sept. 30, 1943, p. 122.

LUFKIN MASTER
PLANER GAGE



HANDLES A WIDE VARIETY OF JOBS

The precision-built Lufkin Master Planer Gage is designed to not only serve better as a planer gage, but it is adaptable to a great variety of other jobs for which the ordinary gage is unsuited. It can be used with gage blocks in building up work on surface plates. It can be used with a Sine Bar in grinding angles. It can be used with an indicator to transfer measurements. It can be used as an adjustable parallel, and it can be used to set cutting tools. The Lufkin Master Planer Gage is truly a "Master" tool. Settings range from ¼" to 6½" and with the extension the range increases to 9". Write for complete Lufkin Catalog.

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SAGINAW, MICHIGAN · NEW YORK CITY

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FOR 35 YEARS

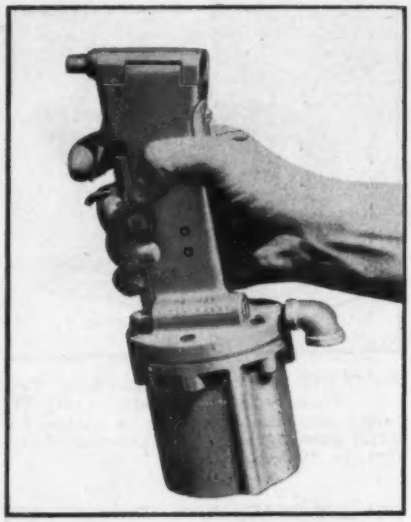
MODEL "C" Automatic
Self-Opening DIE HEAD

• REVOLVING TYPE
• YOKE CONTROLLED TRIPPING AND CLOSING
• EASY TO REMOVE AND REPLACE CHASERS
— just flip the thumb latch and chasers are free.
• SIZES from 9/16" to 2"

THE Model "C" Yoke Controlled Die Head will cut straight true and concentric threads through the long life of the R-S chasers. Body and shank are in one piece. Chasers are locked into place in a tongue and groove joint. A sturdy adjustable pawl fits into the deep notches of the retaining ring to lock setting for size and cut. Add to these features that assure sustained accuracy, the ease and simplicity of chaser removal, which is accomplished in less time than we take to mention it and you have a real production tool.

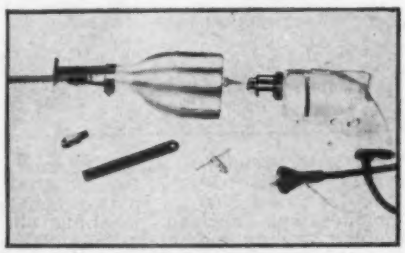
Write today for complete details and answers to your threading problems.

RICKERT-SHAFER CO • ERIE, PA.
DIE HEADS • COLLAPSIBLE TAPS • BORING HEADS
TAPPING MACHINES • SPECIAL THREADING MACHINES



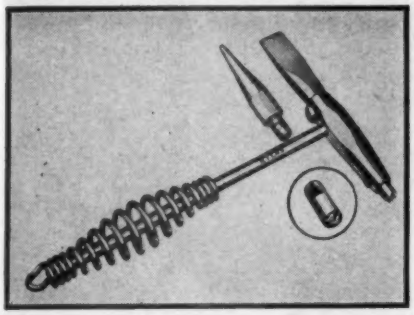
RIVET GUN—*Cherry Rivet Co., 239 Winston St., Los Angeles, Calif.* The unit is all-pneumatic and made for driving blind rivets. Interchangeable heads permit handling of hollow or self-plugging cherry rivets in ¼, 5/32 and 3/16 in. sizes. Sept. 30, 1943, p. 126.

RIV-N-JECTOR DEVICE—*Cleveland Pneumatic Tool Co., 3781 E. 77 St., Cleveland, Ohio.* The magazine holds up to 50 rivets and relieves handling of rivets. June 10, 1943, p. 140.



SAW-GUN ATTACHMENT — *Mid-States Equipment Co., Saw-Gun Div., 2429 S. Michigan Ave., Chicago, Ill.* The unit is suited for panel notching, slotting in plastics and metal and should be used on 2,000 r.p.m. drills. July 22, 1943, p. 130.

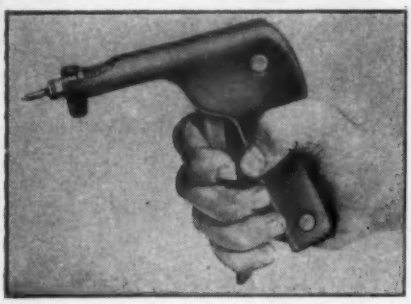
TOOLS and ACCESSORIES — Hand Tools



HAMMER—*Atlas Welding Accessories Co., 307 Boulevard Bldg., Detroit 2, Mich.* The symbol hammer is a combination weld marking tool and chipping hammer. Sept. 30, 1943, p. 126.

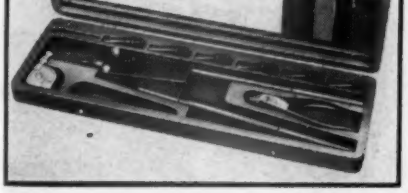
HAMMERS—*Holland Brass Wks., 429 S. Clinton St., Chicago, Ill.* This line of hammers for machine shop use is made with bronze cast head and hickory handle. Sizes range from a few ounces to a 10-lb. sledge type. Not shown. Apr. 29, 1943, p. 126.

HAMMERS—*Greene, Tweed & Co., 4377 Bronx Blvd., New York 66, N. Y.* Plastic faces are now available for Basa replaceable face hammers and Empire mallets. Not shown. Dec. 9, 1943, p. 130.



GUN—*Prestole Div., Detroit Harvester Co., Toledo, Ohio.* The Safety Champ gun is used for assembling Prestite or other skin holders to aircraft sheets. Jan. 7, 1943, p. 118.

SKIN FASTENER—*Detroit Harvester Co., Prestole Div., Toledo, Ohio.* Safety features have been included in this conventional device for aircraft use. Not shown. Nov. 25, 1943, p. 130.



RIVET GUN KIT—*Cherry Rivet Co., 239 Winston St., Los Angeles, Calif.* The G-10 hand gun, interchangeable pulling heads for 1/8, 5/32 and 3/16 in. standard rivets and accessories for the gun are included in the kit. Sept. 30, 1943, p. 114.

W-S Standard Reamers with Carbide tips. Tapered shank (illustrated) and straight shank types. Sizes: 1/4 to 1 1/2.

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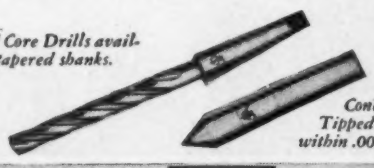

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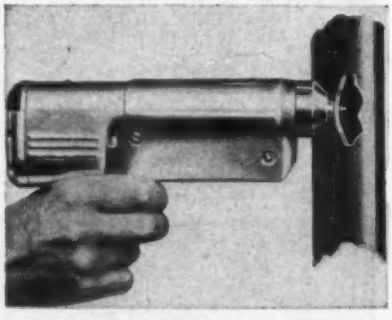
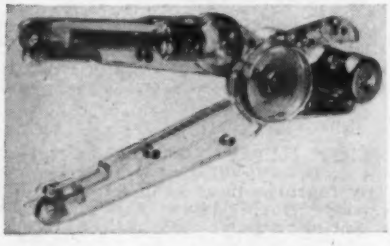
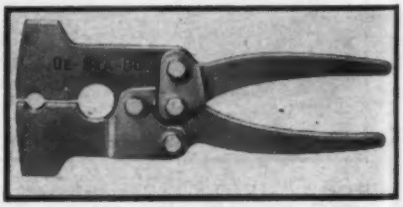
WIRE STRIPPER—*Wood Specialty Mfg. Co., 919 Taylor Ave., Rockford, Ill.* The Speedex is suited for stripping solid or stranded wires and fits sizes from No. 8 to No. 30. May 13, 1943, p. 146.



RIVET DRIVER—*Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 7, Ill.* The pneumatic Riv-Driver handles four blind rivets a minute by a four cycle operation. Dec. 23, 1943, p. 128.



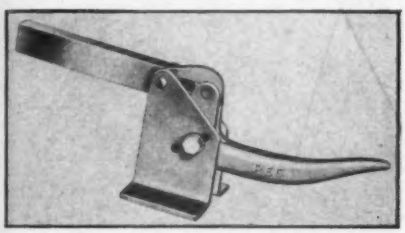
PLIERS—*Star Fuse Co., 235 Canal St., New York, N. Y.* Pliers of Lumarith plastic are now available for pulling and testing fuses. Nov. 25, 1943, p. 138.



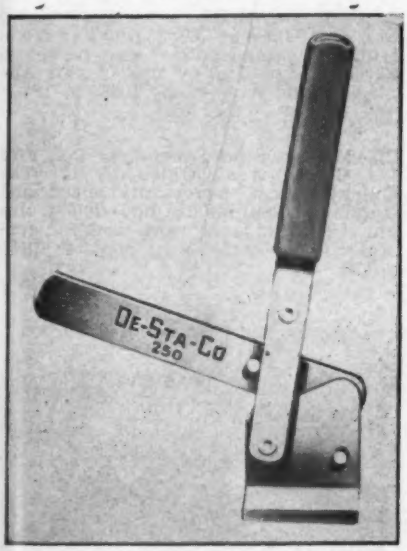
PLIERS—*Detroit Stamping Co., 343 Midland Ave., Detroit, Mich.* De-Sta-Co toggle pliers hold small cylindrical objects ½ to 1¼ in. outside diameter. July 22, 1943, p. 138.

TOOLS and ACCESSORIES — Hand Tools

BUCKING TOOL—*Aero Tool Co., Burbank, Calif.* Bucking and riveting can be done simultaneously with this tool, used for riveting airplanes and other sheet metal parts. Apr. 15, 1943, p. 136.



JIG CLAMP—*Products Engineering Corp., 700 E. Florence Ave., Los Angeles, Calif.* The Pec self-adjusting clamp can be locked in many positions up to 15 deg. above or below horizontal. Feb. 4, 1943, p. 128.



TOGGLE CLAMP—*Detroit Stamping Co., 343 Midland Ave., Detroit, Mich.* Two light-duty styles are available; one with a solid straight bar, and the other with a U-shaped bar. They are fitted with a plastic grip device. June 10, 1943, p. 140.

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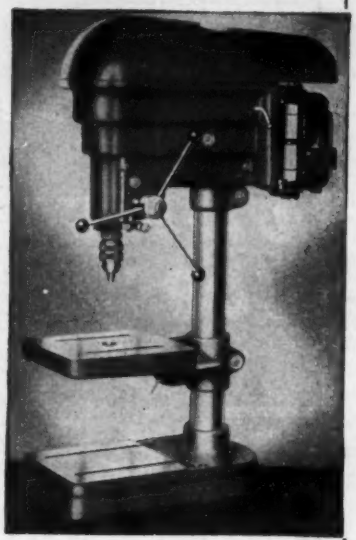

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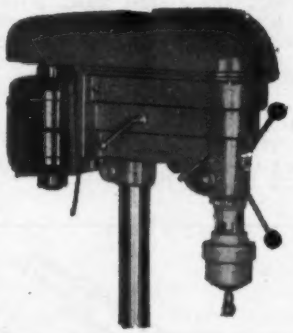

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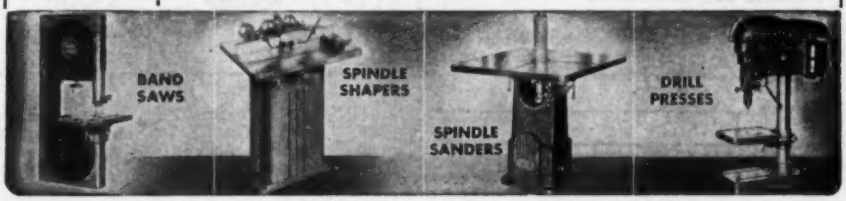

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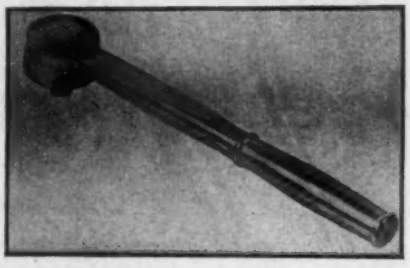
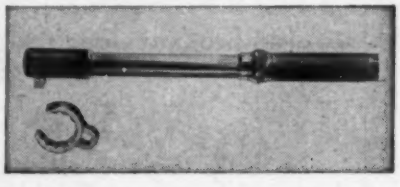
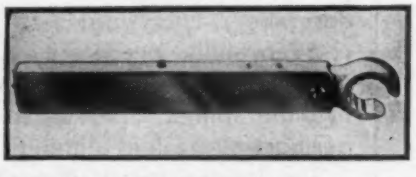


SOCKET WRENCH—*F & H Mfg. Co., 2207 W. Jefferson St., Los Angeles, Calif.* The Wedge-Lock socket wrench available in four sizes features immovable lock for tightening pull. Apr. 15, 1943, p. 142.



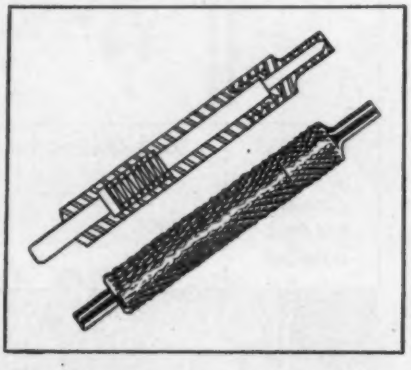
WRENCH—*Joyce & Associates, 819 Washington Bldg., Los Angeles 13, Calif.* The Jomi torque wrench features micrometer type adjustment. Torque ranges available extend from 10 to 2,000 in.-lb. Dec. 23, 1943, p. 128.



WRENCH — *Tubing Seal-Cap., Inc., 215 W. 7 St., Los Angeles, Calif.* The Livermont Torq-Snap wrench gives both audible and physical signal when torque load has been reached. Apr. 1, 1943, p. 124.

METAL SCRAPERS — *Murcott & Campbell, 582 Union Ave., Brooklyn, N. Y.* These are available in a variety of sizes and styles to meet the need of most metal-scraping operations. Not shown. June 24, 1943, p. 134.

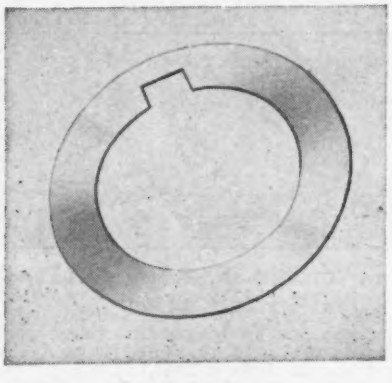
FILE—*Nicholson File Co., Providence, R. I.* This is a sharp tooth file made for use on Naval bronze. Not shown. Feb. 18, 1943, p. 152.



PUNCH—*Tru-Punch, Scotch Plains, N. J.* The Caffin Tru-Punch for aircraft work has interchangeable tips for several size templet holes. Apr. 29, 1943, p. 130.

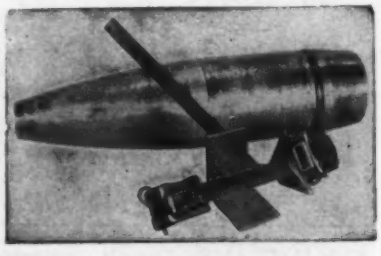
FLARING TOOL—*Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.* Single or double flares on copper or aluminum tubing, and double flares on thin wall steel tubing from 3/16 to ⅛ in. can be made with this tool. Nov. 25, 1943, p. 126.

FLARING TOOL — *Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.* This tool to produce a double flare on plastic tubing is similar to the company's metal flaring tool. Not shown. Dec. 23, 1943, p. 122.



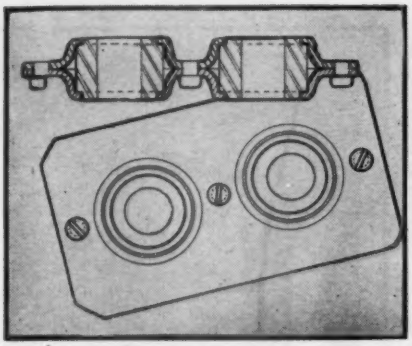
ARBOR SPACER—*Detroit Stamping Co., 343 Midland Ave., Detroit, Mich.* Milling machine cutters can be set to 0.0005 in. spacing by use of this De-Sta-Co spacer. Nov. 25, 1943, p. 134.

CLAMPS—*Grand Specialties Co., 3103 W. Grand Ave., Chicago, Ill.* The Quick-Lockcet, heavy-duty speed and standard C clamps are included in this line, for light large work and for general use. Not shown. Sept. 2, 1943, p. 136.



SHELL HOLDER—*M. E. Cunningham Co., 115 E. Carson St., Pittsburgh 19, Pa.* Identification marks can be stamped on the end and side of semi-finished 155-mm. shell forgings in one operation. Aug. 19, 1943, p. 134.

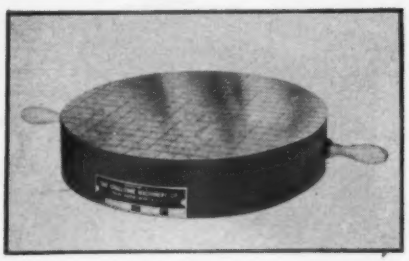
TOOLS and ACCESSORIES — Hand Tools



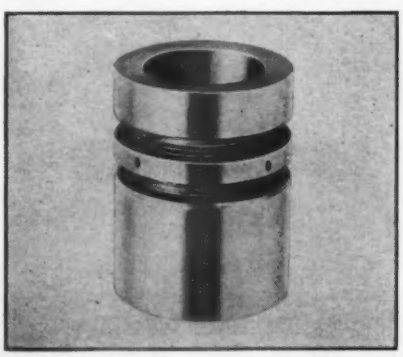
GAGE HOLDER—*Northern Tool & Die Co., 330 N. Albany Ave., Chicago, Ill.* Ring sizes with an outside diameter of 11/32, 21/32, 1¼ and 1-17/32 in., will fit this unit. July 22, 1943, p. 134.

SPACING COLLAR—*Dayton Rogers Mfg. Co., 2830 S. 13 Ave., Minneapolis, Minn.* Maximum over-all adjustment of this collar is ⅛ in. by half thousands. Not shown. Mar. 4, 1943, p. 134.

TOOL CHEST—*George Scherr Co., 128 Lafayette St., New York, N. Y.* It has 11 drawers, including one suited to hold a drill block or handbook; felt lined and fitted with two locks. Not shown. Feb. 4, 1943, p. 126.



LAPPING PLATE — *Challenge Machinery Co., Grand Haven, Mich.* This is an 18-in. round lapping plate equipped with handles. June 10, 1943, p. 126.



MILLING SPACE—*David J. Ross Co., Benton Harbor, Mich.* The Rousselle adjustable spacer for standard milling machines is designed for straddle milling use. Arbar diameters range from 1 to 2 in. Feb. 18, 1943, p. 152.

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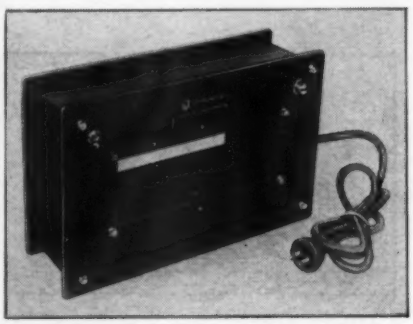
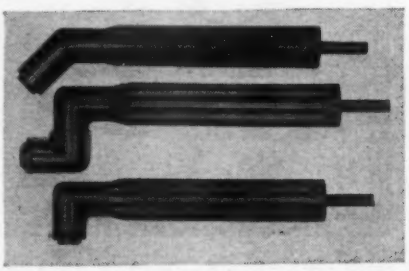
SURFACE PLATE STAND—*Challenge Machinery Co., Grand Haven, Mich.* Three sizes of this portable stand are available to accommodate 18x24, 24x24, and 24x36 in. surface plates. June 24, 1943, p. 138.



DEMAGNETIZER—*Alofs Mfg. Co., Grand Rapids, Mich.* The unit is portable and produced in sizes for 115 or 220 volts a.c. Openings are 2¾x8¼ in. Aug. 5, 1943, p. 128.



DRILL—*Zephyr Mfg. Co., Inglewood, Calif.* These improved angle head drills are suited to close-quarter work. They are available in several sizes and types. Dec. 23, 1943, p. 130.

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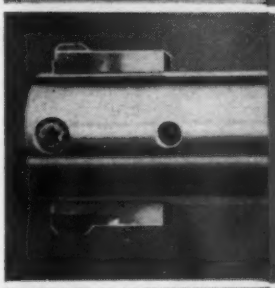

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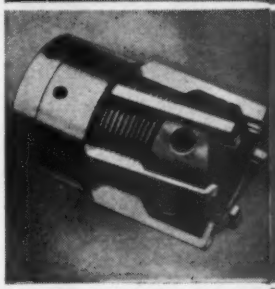
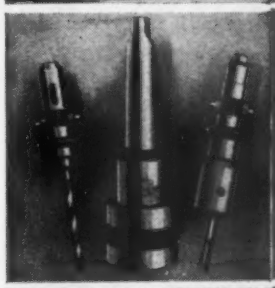


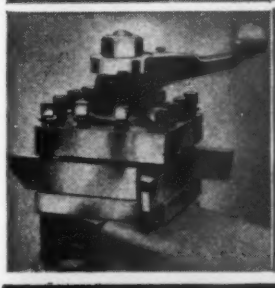
SUPER ADJUSTABLE REAMERS

McCrosky-SUPER time-tested pin and screw lock provides liberal blade adjustment and holds blades rigidly in all adjustment positions. Standard reamers available in various chucking and shell styles and in sixteenth diameters ranging from 15/16 to 6"; ask for Bulletin 16-A, and McCroskey Reamer Manual, for your reference file.



WIZARD QUICK-CHANGE CHUCKS

With a WIZARD Outfit a drill press operator can change tools without stopping the spindle and can safely bottom tap at drilling speed. Tools held rigid and centered. Ask for Bulletin 16-D to help you select chucks and collets for your work. For your operators, ask for McCrosky Quick-Change Chuck Manual.



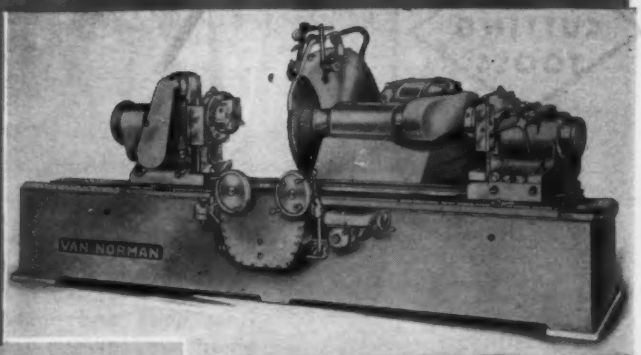
TURRET TOOL POSTS

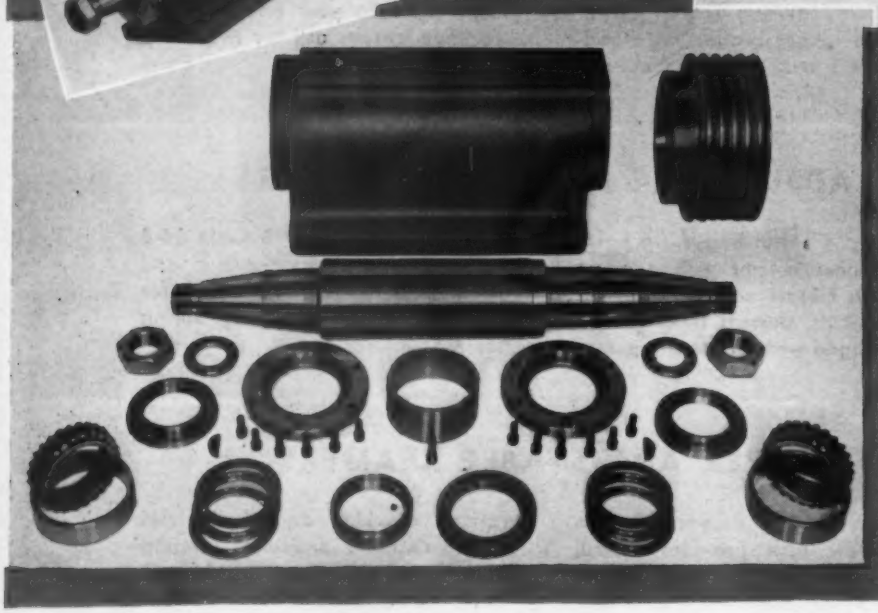
With a McCrosky Turret mounted on his lathe an operator can quickly index into cutting position each tool on a multiple-operation job, without stopping his machine. Five styles of turrets, including one for bench lathes, with several sizes in each style. Ask for Bulletin 16-E to help select the style for your work.

McCROSKY TOOL CORPORATION

MEADVILLE PENNSYLVANIA

The POPE-SKF precision spindle as used in the Van-Norman Crankshaft Re-grinding machine





The new Van-Norman Crankshaft Re-grinder

This diagram shows the exact number of rollers used in the SKF bearings to provide the amazingly complete support of this spindle

This POPE-SKF Precision Crankshaft Re-grinder Spindle

is a complete self-contained spindle unit. It produces unsurpassed grinding finishes, operates at low temperature and requires no attention for lubrication or adjustment.

Crankshaft bearings require a high finish. This demands *rigid radial* and *axial* support of the spindle.

Two individual precision thrust bearings prevent axial movement.

The two SKF double row cylindrical roller bearings are individually and definitely preloaded to the exact radial fit required to assure fine ground finishes and long life.

The rugged ability of cylindrical roller bearings has been long recognized but prior to the development of this SKF bearing it has not been possible to mount such bearings with the proper and necessary radial preload.

With Pope-SKF Spindles all you have to do is snap the switch, go to work and grind —no warming up period is necessary.

This spindle, like all other grinder spindles designed and built by Pope craftsmen, is worthy of its place at the very heart of a machine of extreme usefulness and value to the war effort.

Write for new Bulletin A describing various types of Pope Grinder Spindles.

POPE

REG. U. S. PAT. OFF.

POPE MACHINERY CORPORATION

ESTABLISHED IN 1920

261 RIVER STREET, HAVERHILL, MASSACHUSETTS

BUILDERS OF PRECISION GRINDER SPINDLES

He needs good weapons, too

• PROUDLY we point to our fighting forces as "the best equipped in the world."

We can look with equal pride upon our vast army of industrial workers only when we give them, too, the best implements available.

With *millions* of filing operations taking place every day, file quality becomes a mighty factor in the aggregate of war production.

Just as important is the selection of *The right file for the job* . . . and then giving it the proper care.

Nicholson sets its sights toward aiding industrial concerns in all these directions: (1) Nicholson and Black Diamond Files are so definitely top-quality that their guarantee is *Twelve perfect files in every dozen.* (2) Nicholson makes every kind of regular and special purpose file called for by today's variety of materials and jobs on which files are used. (3) Nicholson provides many forms of help to enable users to get the utmost service out of files.

• FREE—"*File Filosophy*," a highly informative 48-page book, is one. Write for copies for your purchasing and production heads, shop foremen, key mechanics.

NICHOLSON FILE CO., 29 ACORN ST., PROVIDENCE 1, R. I., U. S. A.

(Also Canadian Plant, Port Hope, Ont.)

NICHOLSON FILES

FOR EVERY PURPOSE

NICHOLSON U.S.A. MADE IN U. S. A.

The Collet that "Makes" Precision

The ERICKSON COLLET CHUCK

Collapses 1/32 in. — Retains Gripping Strength and Accuracy.

Collet open at both ends.

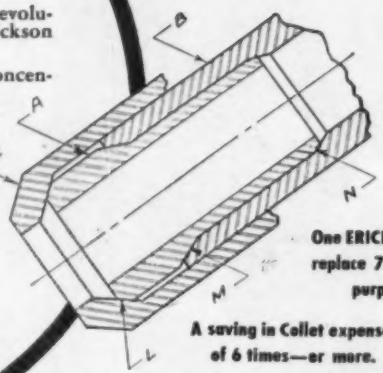
PRINCIPLE

The drawing (right) illustrates the revolutionary principles embodied in the Erickson Precision Collet Chuck.

Collet "A" is automatically lined up concentrically with the axis of the Shank "B" by two Cam Surfaces of the Collet "M and N" mating with the Cam Surfaces of Shank. The Shank and Collet Cam Surfaces are mated to within .0001 inch.

This action aligns Collet with the Axis at the Center of Shank, allowing it to be drawn back by Collet Cam Surface "L" and Nose Piece "C".

Due to the fact that collet is open slotted at both ends, Collet "A" then collapses equally throughout its length to maintain a vise-like grip and remain in perfect alignment with the Axis of Shank.

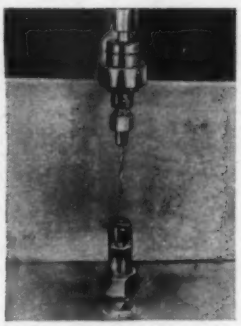


Model "01" accurate within .0005 or less at the nose.

Model "02" accurate within .001 or less at the nose.

One ERICKSON COLLET will replace 7 standard, single purpose Collets.

A saving in Collet expense of 6 times—or more.



Model 301 Chuck adapted to quick change production operation on upper spindle. Note self-contained, interchangeable drill bushings in special nose piece on lower chuck.

Horizontal Miller with 102 Chuck used to hold Woodruff Key Cutter.

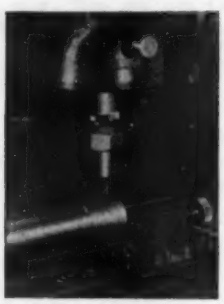
Model 102 Chucks for drilling and tapping operations on Turret Lathe. Jobbers Drill stubbed on chuck in foreground.

Model 201 used in drill press. Extra long drills can be used, by extending them from the chuck as they wear.

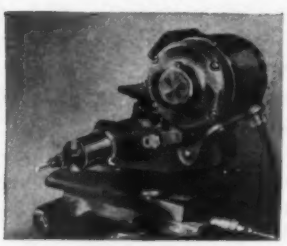
Model 402 Chuck in use on Automatic Screw Machine. Drill gripped on flutes.

Main and auxiliary turrets equipped with Erickson Chucks. Note short drill overhang, taps and reamers.

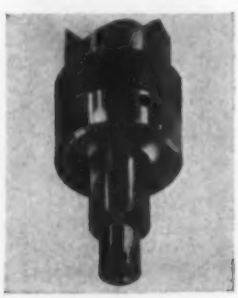
Special Model 202 Chuck used in Hand Drills in Aircraft Industry. 01 Models are regularly recommended for Hand and Air Drills.



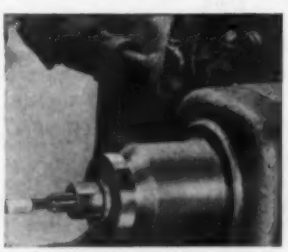
Vertical Milling operation with 101 Chuck.



Tool Post Grinder equipped with Model 301 Chuck.



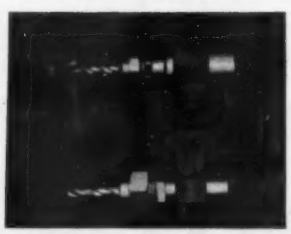
Model 201 High Speed Router Chuck with extend nose piece for pattern following.



Model 301 Chuck designed for high speed internal grinding operations.

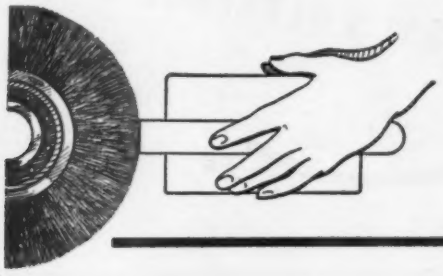
SEND FOR BULLETIN "E"

Model 102 Chuck—adapted for standard floating holder operations.



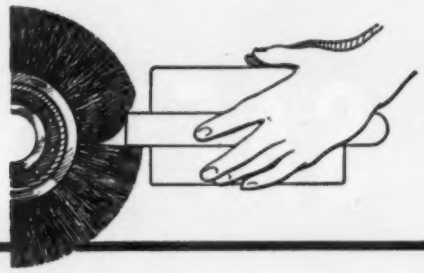
Models 102 and 402 Chucks in use on Automatic Screw Machine.

ERICKSON STEEL COMPANY • 2309 Hamilton Ave., CLEVELAND 14, O.



Right Speed

FREE OSBORN SERVICE HELPS MAKE BRUSHES LAST LONGER



Wrong Speed

Sometimes . . . the slower the speed the faster the brush wears out

IT'S only the wire *ends* of a brushing tool that do the cutting work. At correct speed, centrifugal force holds these wire ends against the work . . . cutting is fast, wire fatigue and brush wear at a minimum.

When speed is too slow, cutting action is poor. It's human nature then for the operator to push the work into the brush. Then the *sides*—not ends—of the wire strike the work, cutting is still further slowed, the wires bend and fatigue more quickly, begin to break off—another good brushing tool is ruined and the brush shortage made worse.

Helping you check the speed at which brushing tools are used is only one part of the Osborn Brush Conservation Service—but this one thing alone has doubled brush life in dozens of plants. Or—if your speeds are fixed—we'll help you select the *right brush for that speed,* and this service, too, has often doubled and trebled brushing tool life.

This Osborn service is free regardless of the types or brands of brushes you use. Write or wire for it—*The Osborn Manufacturing Co., 5401 Hamilton Ave., Cleveland, Ohio.*

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

TO DO A BETTER JOB WITH NATIONAL EMERGENCY STEELS, USE

SAFETY'S NEW NO. 277 GRINDING WHEEL

If you work with National Emergency Steels — if production and efficiency and economy are vital factors in your plant—then by all means investigate the new No. 277 Safety Grinding Wheel. Here is a wheel with a sensationally NEW BOND—a bond developed especially for centerless and cylindrical precision grinding of National Emergency Steels.

Greater latitude of operations is provided . . . assuring faster grinding — improved cutting action — better finish. There is a specific No. 277 Safety Wheel for every National Emergency Steel grinding job. Write us today for illustrated folder and full details on how the No. 277 Wheel is helping to break production records in scores of war plants.

THE SAFETY GRINDING WHEEL AND MACHINE COMPANY

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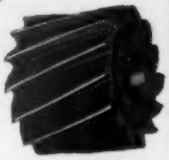
ILLINITE
PRECISION
METAL CUTTING TOOLS

Ground Hobs


Milling Cutters

Ground Form Tools

Shaper Cutters

Broaches

Special Tools . . . Gear Measuring Machines . . .
Gear Measuring Blocks . . . Die Filing Machines

Fundamentally, it is engineering ability which sets any manufacturing organization apart from its contemporaries . . . . The experience of "Illinois Tool" engineers in solving gear design and production problems is at your service.

OVERNIGHT TO ALL AMERICA . . . FROM THE HUB OF AIR TRANSPORTATION

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MANUFACTURERS OF METAL CUTTING TOOLS AND SHAKEPROOF PRODUCTS

Immediate Delivery

L-W LATHE CHUCKS

● Body is of semi-steel, heavily ribbed, will withstand unusual strain. Hardened steel jaws, accurately ground, have wide gripping surface. Steel thrust bearings are provided to give long wear and durability.

10″ Size	$33.45
12″ Size	38.30
14″ Size	43.45
16″ Size	55.60
18″ Size	73.60

We can also supply 3 jaw Universal chucks in the following sizes: 6¼″ — 7½″ — 10½″.

A new free catalog is now available . . . write for it today.

Also Manufacturers of Magnetic Chucks • Demagnetizers Milling Machine Vises • Power Hack Saws • Dividing Heads

L-W CHUCK COMPANY

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We also manufacture **LATHE CHUCKS • MAGNETIC CHUCKS • DEMAGNETIZERS • MILLING MACHINE VISES • POWER HACKSAWS**

These Lock Nuts

"HOLD EVERYTHING"

Tapped by *6-6-2* for Accurate Threads and Longer Tool Life on the Job!

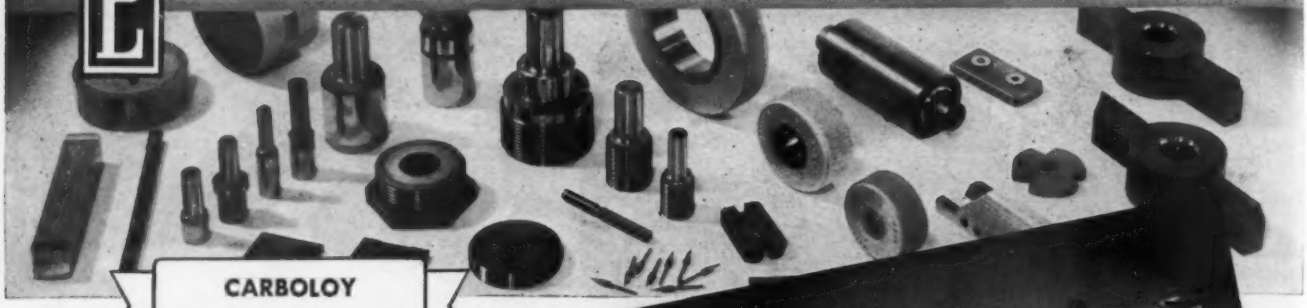
On tank or plane, these vital self-locking nuts go on for keeps, no matter how tough the service. Their prominent manufacturer uses *6-6-2* for the all-important tapping operation —chosen by experience over other steels for *a cleaner, better job and longer life.*

Vanadium-Alloys

STEEL CO. LATROBE, PA.

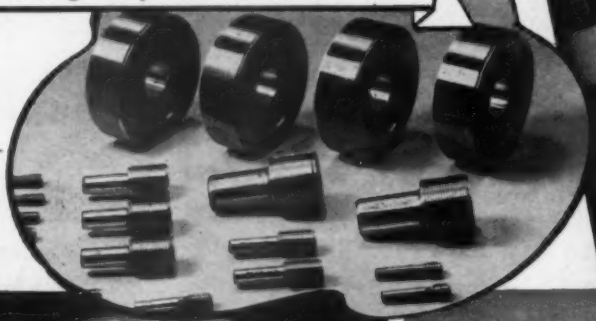
These Are Typical of

LINCOLN PARK GAGES AND NON-CUTTING PRECISION TOOLS

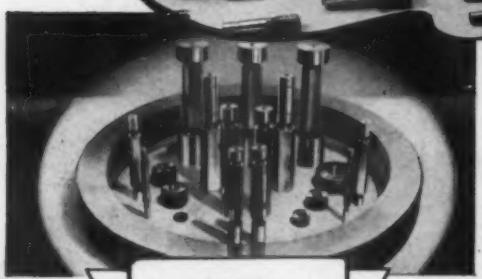


CARBOLOY

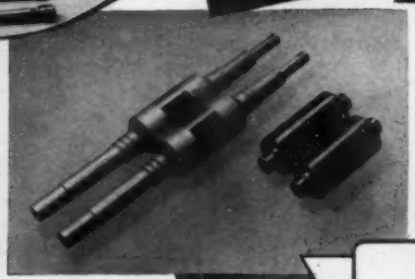
THREAD PLUG GAGES
Salvaged by Hard Chrome Plate

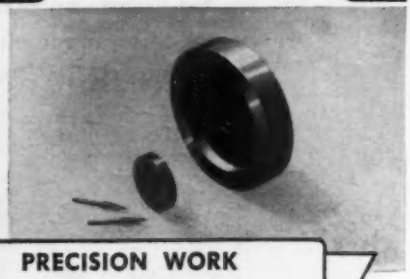


CHROME PLATE
NEW and SALVAGED

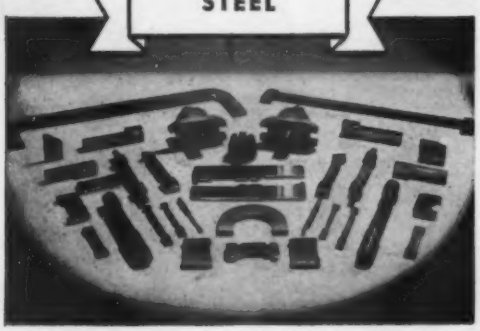


STEEL





PRECISION WORK
IN CARBOLOY



For full information on any of the products pictured here, see your nearest Lincoln Park representative or write directly to the plant.

CARBLOX CEMENTED-CARBIDE
GAGE BLOCKS

ARMY E NAVY

LINCOLN PARK TOOL and GAGE CO.
LINCOLN PARK, MICHIGAN

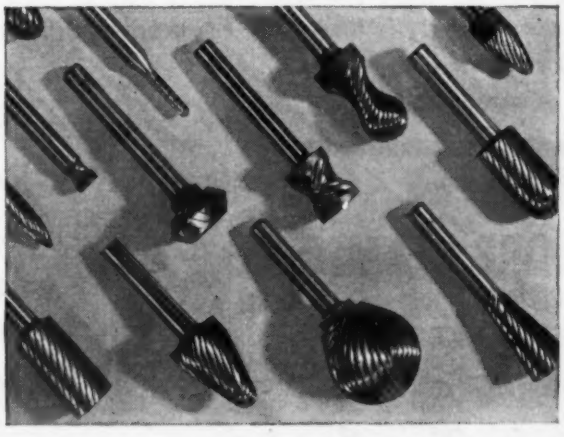
SEVERANCE DISC CUTTERS SPEED FINISHING OF PLASTICS

When it comes to finishing moulded plastic parts, you can't beat Severance Cutters. One efficient installation is shown here. A Severance rotary disc cutter mounted on a spindle with an adjustable table allows perfect finishing of the rough edges with amazing speed.

Severance disc cutters are made of High Speed Steel, in a wide range of sizes. Their teeth are cut in a staggered pattern which produces a shearing cut and thus eliminates chatter.

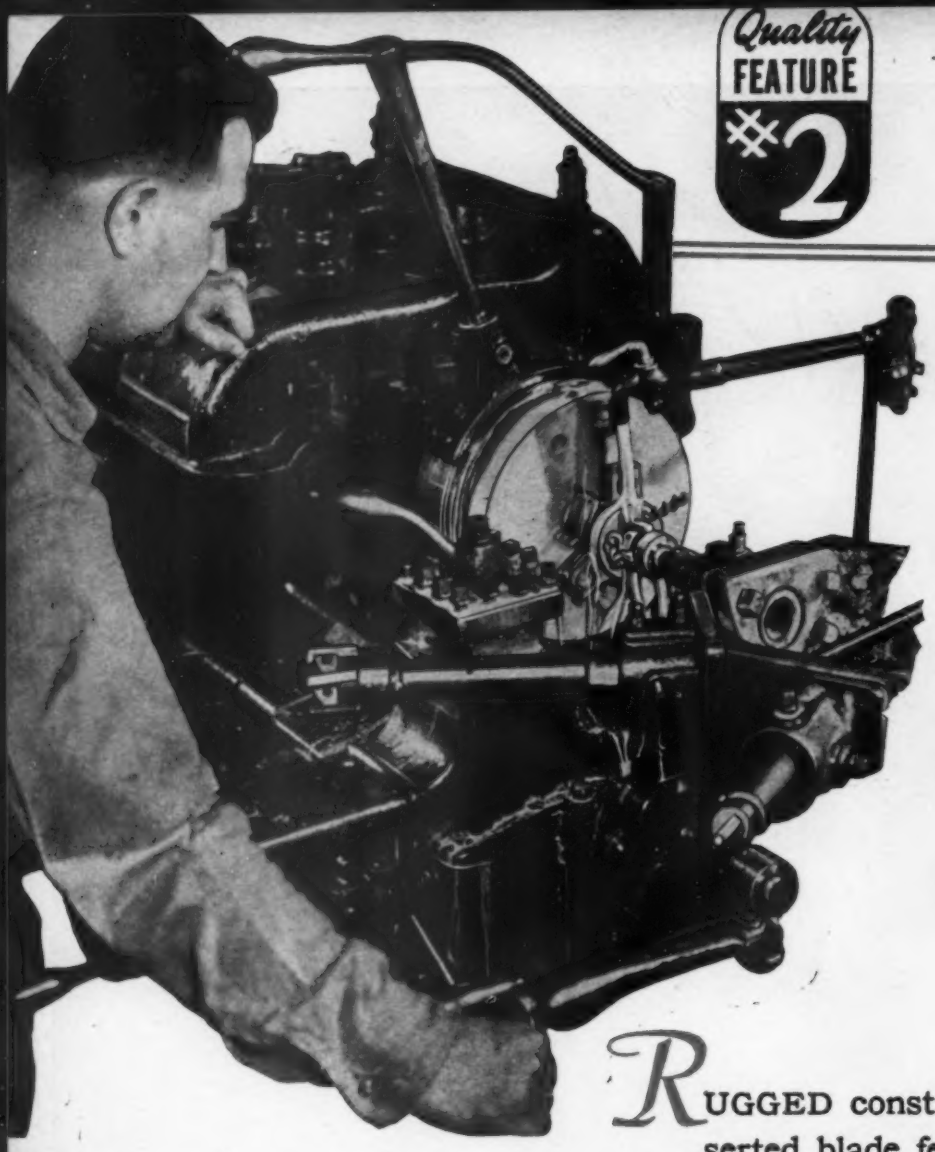
If you are having difficulty in finishing any manufactured parts, send us samples and our Engineers will design cutters to solve your problems.

Severance complete line of "Carbide" Midget Milling Cutters are now available.



Severance

SEVERANCE TOOL INDUSTRIES INC., SAGINAW, MICHIGAN.
PLANTS IN LONG ISLAND CITY, N. Y.; DETROIT, MICH.; FORT WAYNE, IND.; CHICAGO, ILL. AND LOS ANGELES, CAL.



Quality FEATURE ※2

WETMORE

Adjustable

* REAMERS

RUGGEDNESS for long life, heavy cuts

RUGGED construction, along with the inserted blade feature, is another Wetmore characteristic that means lower machining costs through long life and the ability to take heavy cuts.

Reamer and Boring Bar parts are made of the highest quality alloy steel, specially heat-treated for strength, toughness and long life. Standard blades are high-speed steel, with special heat-treatment to insure long life and low cost per hole. Cast alloy or tungston carbide tipped blades are also furnished.

Wetmore tools are used in top-flight metal-working plants all over the country because they have a combination of design features found in no other reamers or boring bars. Let us help you solve your production problems.

STOCK DELIVERY

Wetmore standard Reamers are now available from stock for quick delivery; and unusually good delivery is made on Boring Bars and special tools. Phone, write or wire.

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WETMORE REAMER CO.

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Write for New Catalog

WETMORE QUALITY

Reamers *Boring Bars*

STERLING

Here's Where We Put the Squeeze on the *Axis* . . .

Every hydraulic press at Sterling is working overtime these days, creating from carefully selected bonds and abrasive grains the many sizes and shapes of the "Wheels of Industry" needed to speed materials of war from hundreds of mills and factories working today and everyday for victory.

We, at Sterling, work with the fullest realization that grinding wheels are important if planes, tanks, guns, and ships are to be turned out in quantity and on time.

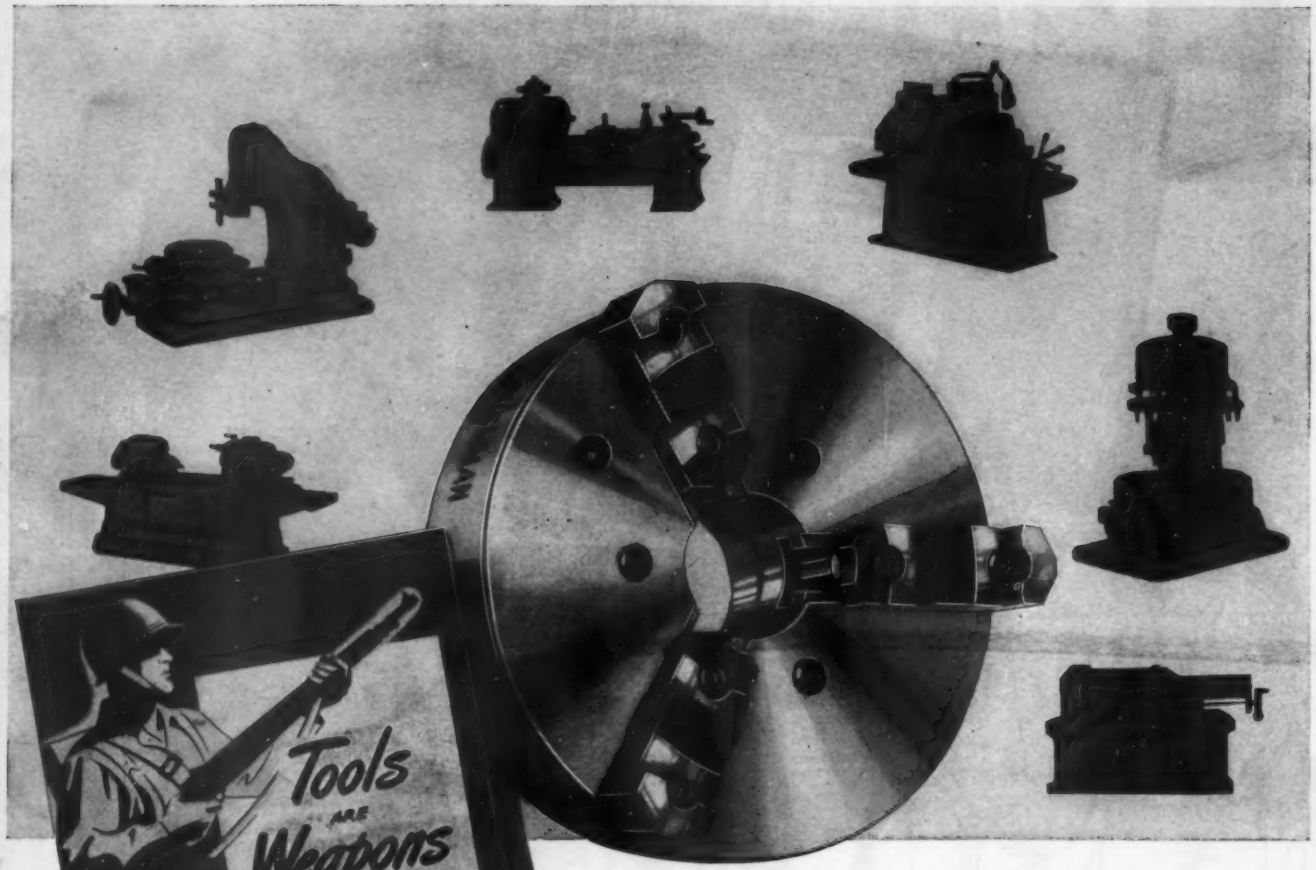
Catalog 43 is an important book. Send for it!

The use of the correct grinding wheel often helps meet tough production schedules. Unusual jobs or new alloys often need new wheels. Finding the correct Sterling Grinding Wheel to do your difficult job better and faster is the job of the Sterling engineer in your territory who will gladly call at your request. Often, after a consultation and use of recommended wheels, production has jumped 25% and better! May we see if this is possible in your plant . . no obligation naturally!

• STERLING ABRASIVES •

THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY



with CHUCKS that means...

1 CHOOSE 'EM RIGHT

. . . choose the right type of chuck for the job and the right size of chuck for the work. Choose the jaw equipment that will give you required flexibility for your shop. Avoid any temptation to overload chucks that are too small or to permit "make-shift" set-ups with incorrect jaw equipment.

2 MOUNT 'EM RIGHT

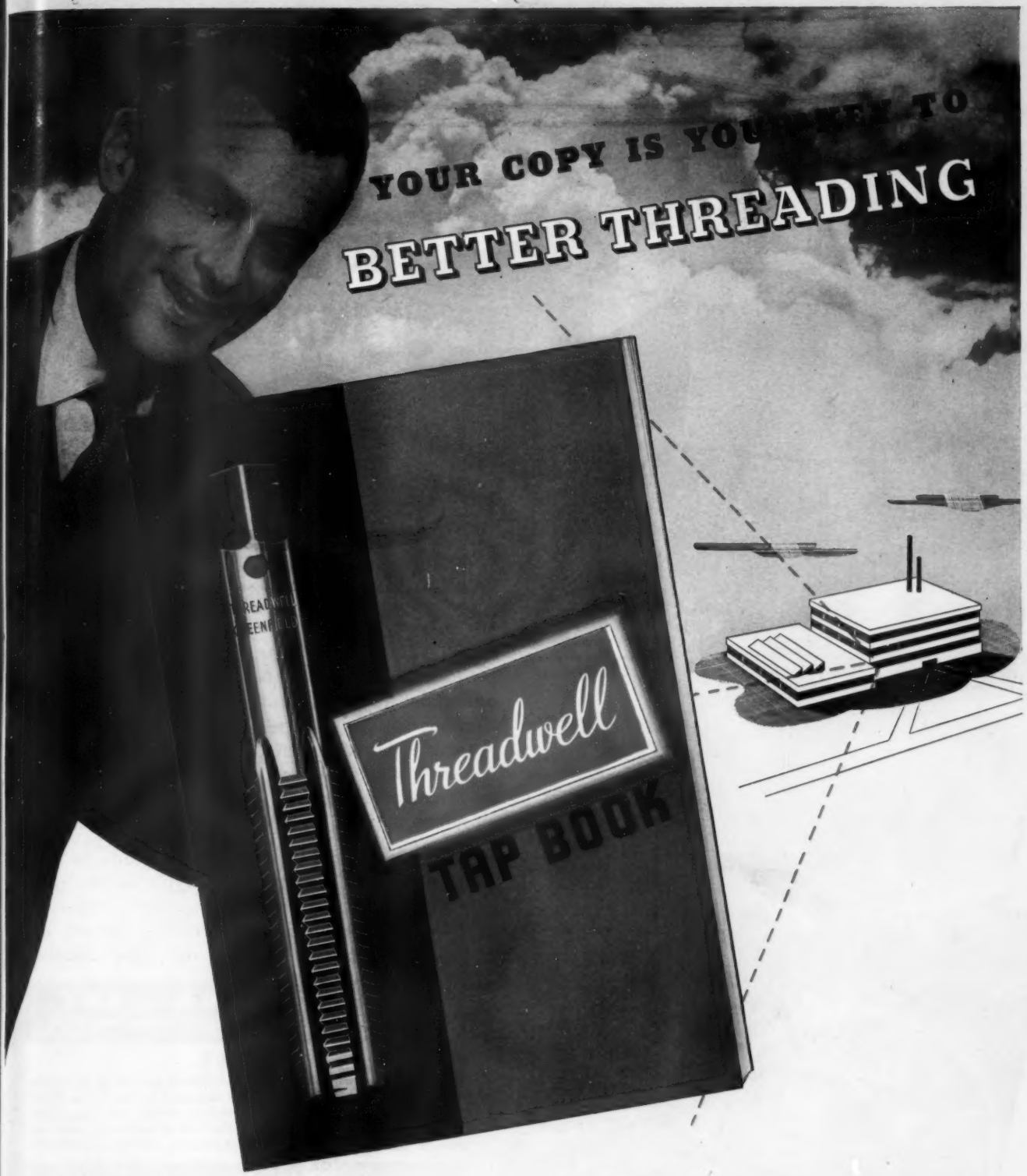
. . . the very ease and speed with which chucks can be mounted on any of the new standard spindle noses (American Standard, Cam Lock, Long Taper Key Drive) tends to cause some carelessness. ALWAYS be sure ALL bearing and seating surfaces are clean . . . free from dust, chips, etc. Never force chucks into seating. Otherwise accuracy will suffer.

3 USE 'EM RIGHT

. . . regular lubrication, keeping surfaces clean, avoiding over extension of jaws, care in opening and closing . . . these little things will help you prevent delays, work spoilage and waste. We have prepared small "Chuck Check" maintenance cards that emphasize these important points. A supply for distribution to your operators will be furnished free on request. The Cushman Chuck Company, Hartford, Connecticut.

CUSHMAN CHUCKS

A WORLD STANDARD FOR PRECISION



Here is a new handbook for the man who uses taps — to help him get more production — to help him cut better threads.

Realizing that even the best tap will not give good service unless used correctly, Threadwell has prepared this book. It is written in simple non-technical language and yet it covers all of the important things you should know about taps and their use. You can get your copy of the new Threadwell TAP BOOK from your Threadwell distributor or by writing directly to the —

THREADWELL TAP AND DIE COMPANY • GREENFIELD, MASSACHUSETTS, U.S.A.

Zagar FIXTURES FOR *FASTER* HOLDING AND INDEXING

Castellating hex nuts, over 900 slots being milled per hour. Ideal set-up for limited production and variety of sizes. 1″ Index Fixture.

Milling 1¾″ hex threads on studs. Short order — only 200 pieces. Rate — 13 pieces an hour. Only 2 seconds to load and index. 2″ Index Fixture.

Milling 54 spring slots in tool steel per hour, indexing 3 times at 120°. 2″ Index Fixture.

Continuous production attained. One part is loaded while a second is machined. 2″ Zagar Holding Fixtures.

Ask for the latest Zagar Bulletin "A-20"

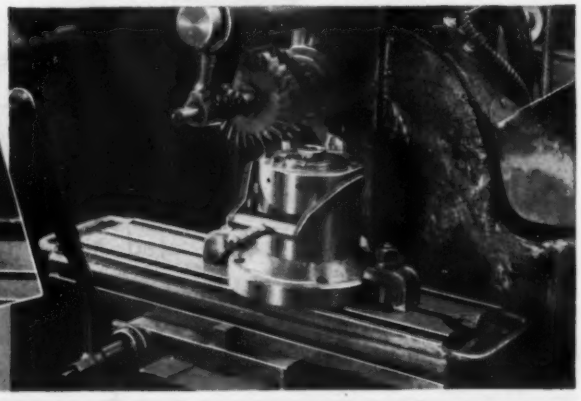
Zagar Holding and Index Fixtures are adapted to milling, drilling, tapping, slotting, grinding and like operations. They eliminate the need for special tooling and involved multiple set-ups. Users praise these features:

1. ***Simple design.*** Beginners "catch on in no time". 2. ***Rugged construction.*** 24-hour-a-day performance day in and day out. 3. ***Speed of operation.*** Workers hang up one record after another. 4. ***No maintenance.*** Practically indestructible. No complicated parts to get out of order. 5. ***Accuracy and rigidity.*** You can easily meet close tolerances which grow closer from month to month.

Both holding and index types are made in two sizes — 1″ and 2″. Standard type collets and pads are used. Zagar Fixtures have come to occupy a place in metal-working plants as fundamental as ever-present vises and chucks.

ZAGAR TOOL, INC.
23880 Lakeland Blvd. Cleveland, Ohio

Are you sometimes intrigued by the possibilities of ganging up 10 or more parts? Such complicated procedure may look good on first glance. However, a simple set-up using a Zagar Holding Fixture often jumps average production 100%. 2″ size here. Milling flats on bolts — 62 pieces per hour. No special tooling necessary. STANDARD ZAGAR EQUIPMENT.



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ONE WORD
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doz. HACK SAW BLADES Made of Ingersoll A D-B-L STEEL

When You Do So—You Get
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at No Extra Cost

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(Tungsten ..... 5.00-6.00)
(Molybdenum .. 4.00-5.00)

The remarkable performance of Ingersoll D-B-L... its relative freedom from decarburization...its tough cutting quality and its high impact resistance...plus its lower cost, have made it a wartime favorite.

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Specify *Ingersoll* D-B-L, on its 4-year record of past performance.

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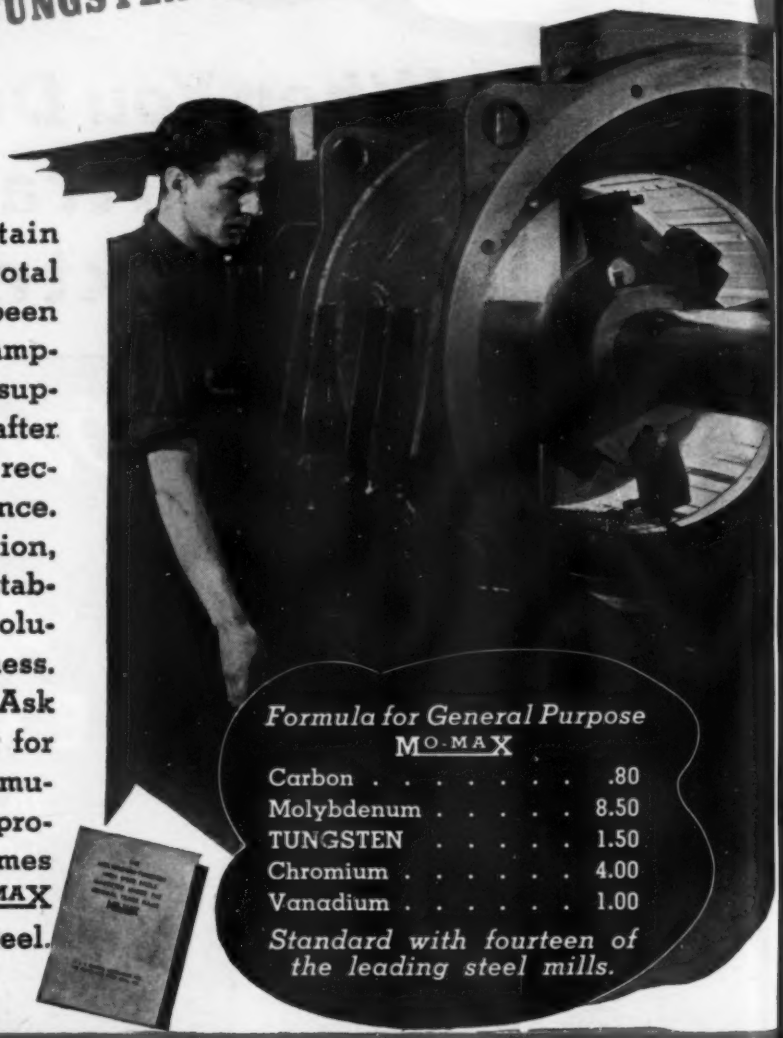
Restrictions are off

MO-MAX

TRADE MARK REG. U.S. PAT. OFF.

MOLYBDENUM-TUNGSTEN HIGH SPEED STEEL



The war-born shortages in certain materials, which restricted the total possible output of MO-MAX, have been overcome. No longer need you be hampered by inability to obtain adequate supplies of MO-MAX. Today MO-MAX, after ten years of successful use, has a record of tested and known performance.

For quality and quantity production, STANDARDIZE on thoroughly established MO-MAX, the steel that revolutionized the high speed steel business. It is available from reliable sources. Ask your nearest regular steel supplier for MO-MAX. If it is not in stock, communicate with any of the tool steel producers listed below. Their brand names shown on this page are all MO-MAX molybdenum tungsten high speed steel.

Formula for General Purpose
MO-MAX

Carbon	.80
Molybdenum	8.50
TUNGSTEN	1.50
Chromium	4.00
Vanadium	1.00

Standard with fourteen of the leading steel mills.

For technical data booklet, write any mill named or The Cleveland Twist Drill Co., Cleveland, Ohio.

THEY'RE ALL MO-MAX

"LMW"	Allegany Ludlum Steel Co.	"Molite 8"	Columbia Tool Steel Company	"Tatmo"	Latrobe Electric Steel Co.
"Mohican"	Atlas Steels, Ltd.	"Rex-T-Mo"	Crucible Steel Co. of America	"S.T.M."	Simonds Saw and Steel Co.
"Bethlehem HM"	Bethlehem Steel Company	"Di-Mol"	Henry Disston & Sons, Inc.	"Mo-Tung"	Universal-Cyclops Steel Corp.
"Mo-Cut"	Braeburn Alloy Steel Corp.	"Rex-T-Mo"	Halcomb Steel Co.	"Vul-Mo"	Vulcan Crucible Steel Co.
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Here's Fast Accurate Economical Thread Cutting!

Modern Stationary Type Self-Opening DIE HEADS

embody features that make them ideal tools for general purpose work. Simple yet rugged in construction, they are positive in opening and easily adapted to practically every thread cutting operation within their capacity. All parts are of hardened steel, ground to absolute accuracy. A minimum number of parts reduce wear and make for long life.

Style T Die Heads are made in capacities from 1/8" to 2". Style B Die Heads may be had in capacities from 2 1/2" to 7". Thus, a small investment enables a shop to handle a wide range of thread cutting jobs. For more complete information send for Bulletin M-123.

We Can Make Prompt Shipment — What Are Your Requirements?

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DIVISION OF
CONSOLIDATED MACHINE TOOL CORPORATION
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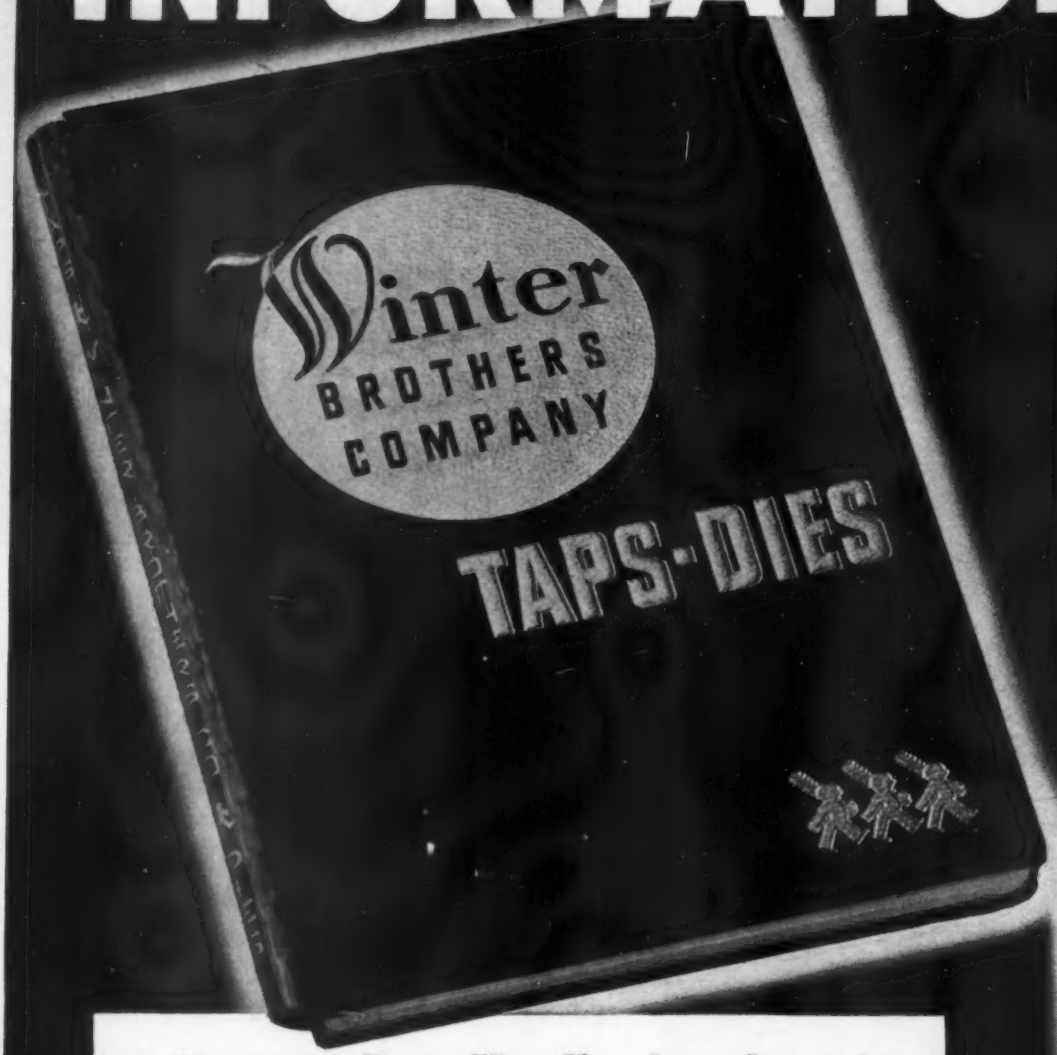
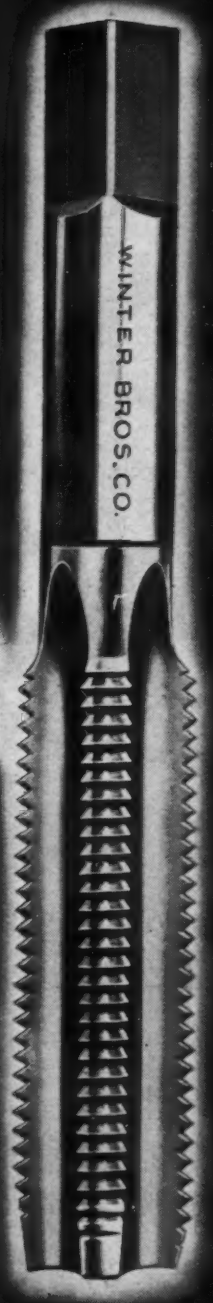
INFORMATION?





A New 144 Page Handbook and catalog of useful data on TAPS & DIES especially cross-indexed for quick reference.

The answer to your threading problems.

Sent Free if requested on Company Letterhead.

Tap and Die Division of National Twist Drill & Tool Co., Detroit, Michigan

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FINER • *FASTER* • DE-BURRING FINISHING • POLISHING

If you look at Brightboy through a microscope, you'll see an abrasive impregnated *clear through* a piece of resilient rubber. You'll understand at a glance the proved principle of "rubber cushioning"—the fact that the abrasive recedes into the rubber when work is in process—how both the abrasive and the rubber *combine* in an all-in-one de-burring, finishing and polishing action.

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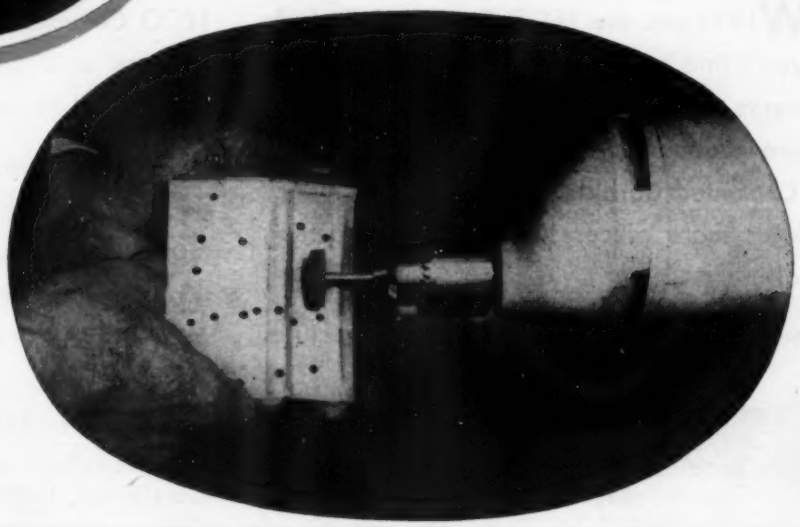
Brightboy wheels are made for use on grinders, lathes, presses, polishing machines. No special preparation required. Brightboy rods and blocks are made in a number of sizes—their flat or curved surfaces can be applied to parts worked by hand.

BRIGHTBOY METHODS AND APPLICATIONS are described in detail in an attractive booklet which may be obtained together with prices from your distributor or from us. Brightboy field representatives are at your service. *Investigate Brightboy now!*

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO. **Newark, N. J.**



3 TEXTURES

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BRIGHTBOY STANDARD

Brightboy STANDARD texture is a favorite for de-burring, finishing and polishing on the widest variety of metals and metal parts.

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BRIGHTBOY FINE-TEX

Smoother, finer texture for work on softer metals, producing special finishes and for applications where the coarser wheel might not be suitable.

WELDON ROBERTS
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Tougher texture, for finishing hard metals. The tougher binder accents the abrasive action, yet retains the soft rubber cushion, finishing and polishing in one operation.

WELDON ROBERTS
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WHEN you use TECO Cemented Carbide tools, you'll find it unnecessary to maintain excessive reserve stocks of cutting tools. You actually get *more* production with *fewer* tools, because TECO Cemented Carbide stays on the job longer—produces more pieces than any other cutting material.

Extremely hard, dense and uniform in structure, TECO Cemented Carbide has unusual resistance to wear and breakage in high speed turning, boring and facing operations.

Our manufacturing facilities assure prompt and dependable shipment to meet your production requirements. Grades, styles and sizes for practically every machining need.

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TECO Pioneers in Tungsten Carbides for over a Quarter Century **CEMENTED CARBIDE**

Take a Good Look At
ATKINS
Curled-Chip Teeth
THE TOOTH DESIGN THAT REVOLUTIONIZED METAL CUTTING
See the "Tangent-Ground Clearance Angle"
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• If you've never seen an Atkins Curled-Chip Metal Cutting Saw, it will be a revelation just to examine it—to see the scientific tooth design, the large curved gullet, the balanced-cut grind of alternate teeth. For these and other Atkins developments are the reasons for outstanding performance of Curled-Chip Saws on just about every kind of metal in industrial use. Figure out what two to three times the service between grindings you'd expect from ordinary saws, extra-heavy rates of feed, and smooth finish without heavy burrs, will do to production on your work—and decide now to get the whole story (plus demonstration) from Atkins Engineered Cutting Service. Write us today.
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Tools are Weapons . Treat 'Em Right

HOW TO CHOOSE YOUR TOOLS

Simply and Scientifically

UP TO 90 SURFACE FEET PER MINUTE

use

HIGH-SPEED STEEL TOOLS

HIGH-SPEED STEEL TOOLS have their place at the slower speeds indicated. At higher speeds, these tools require frequent grinding, production suffers and valuable time is lost. They cannot approach the production-per-grind that is possible with Tantung Cast Alloy or Cemented Carbide Tools.

BETWEEN 90 AND 190 SURFACE FEET PER MINUTE

use

TANTUNG CAST ALLOY TOOLS

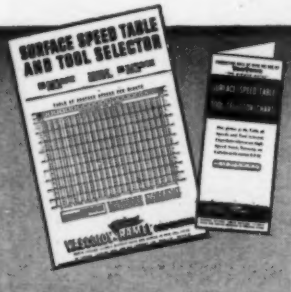
TANTUNG "fills the gap" between High-Speed Steel and Carbides. It cuts rolled, forged or cast steel, annealed or heat treated, and any material that can be machined. Operates at greater speeds, heavier cuts, heavier feeds, produces more pieces per grind and better finish than high-speed steel. Write for the new Tantung Tool Catalog today.

FOR HIGHER SPEEDS

use

CEMENTED CARBIDE TOOLS

VASCOLOY-RAMET CARBIDE TOOLS were the first successful cemented carbides developed for machining steel. The superiority of Vascoloy-Ramet Carbide is due to the inclusion of Tantalum Carbide, an extremely hard material that imparts a self-lubricating action which minimizes cratering or chip wear. Highest quality.



FREE WALL CHART

See at a glance Table of Speeds, Feeds and Tool Selector. Chart shows when to use High-Speed Steel, Tantung or Carbides to best advantage. Printed in color, on heavy stock, ready to hang. Reprinted by popular demand. Advise how many Wall Charts your plant will need.

FREE POCKET CHART

The same Table of Speeds, Feeds and Tool Selector is available also in a Pocket Size Chart for operators as well as supervisors. Advise how many Pocket Size Charts your plant will need.

Vascoloy-Ramet high standard of quality is measured by results rather than price. Vascoloy-Ramet Corporation and the Fansteel Metallurgical Corporation (world's foremost producers of Tantalum) work hand in hand to assure tool users peacetime quality under wartime conditions.

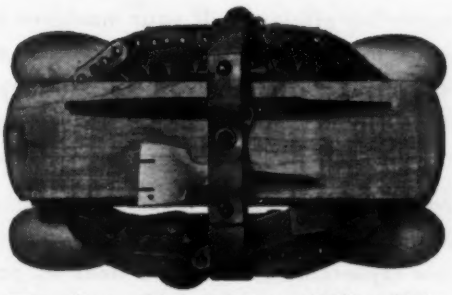
Ramet

VASCOLOY RAMET CORPORATION

NORTH CHICAGO, ILLINOIS • DISTRICT SALES AND SERVICE IN PRINCIPAL CITIES

Tools as well as arms go into battle. For troops in the spearhead of attack who must clear the way for motorized advance, Disston builds this Folding Chain Saw.

Folding into a compact unit that can be easily carried or stowed, this saw can be assembled in a jiffy—slung about a tree in a trice—and, in seconds, be put to work doing an astonishingly fast and able job of felling . . . Is it any wonder that the Allied Armies around the world use the Disston Folding Chain Saw—and one of America's largest builders of mechanized war machines includes it as standard equipment?



When disassembled, the Disston Folding Chain Saw becomes this compact, conveniently carried unit.

Back of the remarkable effectiveness of this ingenious piece of military equipment is a century-old history of superior saw making. Disston can build *special* wartime tools like this with such success because of a background of quality craftsmanship, long and earnestly devoted to making better *standard* tools.

For information about such standard Disston tools as wood and metal cutting saws, files, hack saw blades, tool bits and machine knives, write Henry Disston & Sons, Inc., 120 Tacony, Philadelphia 35, Pa., U. S. A.

DISSTON

Conserve Man-Minutes and help win the war

From an editorial in the November, 1943, issue of "Screw Machine Engineering".

Quality Mass Part Production Is Coming

Our industry can never turn back to the days when the *quantity* of parts turned out per machine was the dominating factor. It is still important to machine units at minimum cycle time, but the *quality* of these parts is, and must continue to be of equal or greater concern—and quality will continue to predominate all other phases of mass part production for years to come.

MODERN COLLET CAN HELP YOU MEET TOMORROW'S COMPETITION IN

Screw Machine Production

It is—and for many years has been—Modern Collet's business to work with you in keeping your screw machines operating efficiently. If your machines have seen more than their share of service . . . are of older models or are simply generally worn out . . . they can be completely rebuilt and modernized by the most thorough methods ever developed for this type of work.

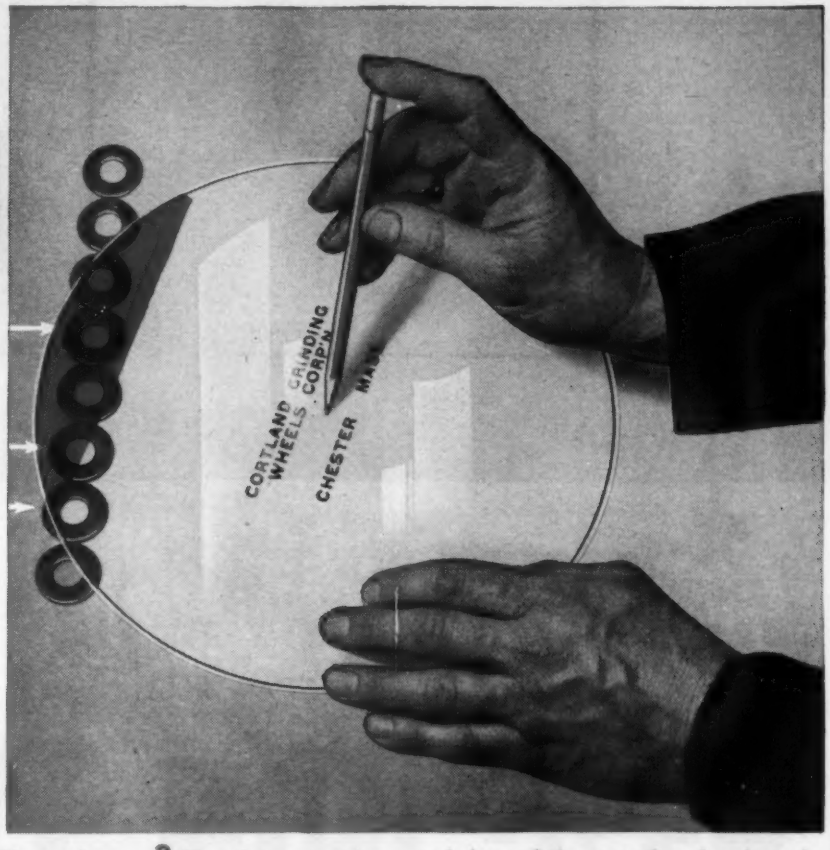
If spindle carriers alone require modernizing, Modern Collet offers this specialized service. When individual parts require replacement, complete lines of parts—many of exclusive, up-to-the-minute design—are available. And included in the lists of Modern Collet stock items are many of the screw machine tools which are more widely used than any others manufactured today.

The efficiency of your screw machines may be a most important factor in your ability to meet future competitive situations. Why not talk to a Modern Collet representative *today* about what can be done to improve the operation of your present equipment.

MODERN COLLET and MACHINE CO.

405 Salliotte Street . . . Ecorse 18, Michigan

He looked through this Disc
and found the Answer . . . *



He was a harassed manufacturer, in the midst of renegotiation. Not a particularly good time to call and try to talk about grinding wheels . . .

"Grinding Wheels? Hell — I need *lapping* compounds! Look at these specifications: S.A.E. 52100 — 63–65 Rockwell C scale – *surface finish 2 micros* — and production's gotta be stepped up! . . . *What's that thing?*"

"Just a piece of clear plastic. It represents the segments in your vertical spindle grinders. Now imagine that these washers are the *work* on your tables. Would you mind rotating this disc counter-clockwise . . . slowly . . . **1** See how the narrow end of the Cortland Segment starts to pass over the work? Shock and resistance minimized; large surface still exposed to coolant . . .

"Keep going . . . **2** Watch the action of the straight inner edge of the segment — See how it travels *diagonally* over the work? We call it *Diagonal Shearing* — with varying contact it *shaves* off the metal . . .

"Keep going . . . **3** Now the segment is in full surface contact with the work. Maximum heat is generated, but only momentarily, because as the segment continues to pass across the work, more and more of the ground surface is again exposed to the action of the coolant.

"That's the story back of the success of Cortland Chucks & Segments — *Diagonal Shearing* with varying contact — for better, faster cutting; minimum shock; maximum area exposed to coolant; and ground material swept aside. Better surface grinding, less segment wear, less power needed, lower overhead and maintenance . . . All good answers, don't you think?"

★ ★ ★

* . . . the Answer to a problem in Surface Grinding. The problem may involve a Profilometer reading of 2 microinches; or hardened steel parts that heat and squeal; or table loads that take too long to grind or require too much amperage, or need too many segment dressings. . . . You'll find these problems *solved* — and many more in the true case histories presented in the Cortland Chuck & Segment Bulletin. For a free copy write on your letterhead to

Cortland Grinding Wheels Corporation
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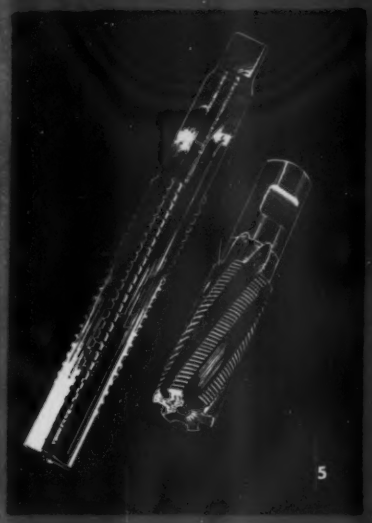
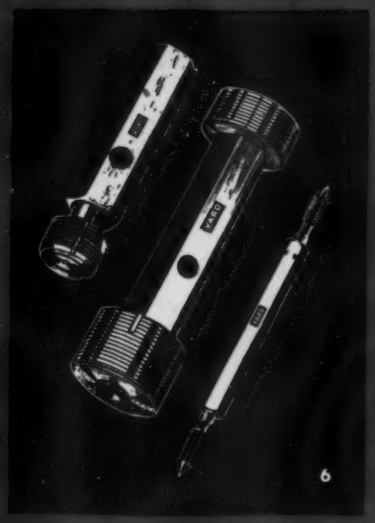
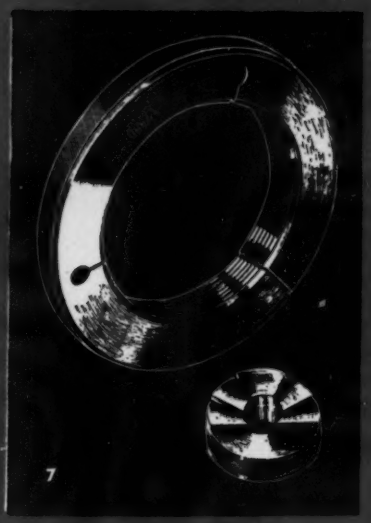
CORTLAND
Chucks and Segments

LET'S WIN THE WA







N '44

VARD PRODUCTS CAN HELP YOU DO YOUR PART

VARD makes munitions of war—gages of all types, aircraft hydraulics and geared parts, optical elements and lens treatments.

In one of the most completely equipped precision manufacturing plants in the West we are turning out tools and parts that help carry on the war.

Let us help you complete your war contracts—on time. Let's work together to Win the War, and plan together for the Peace to follow.

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2. AIRCRAFT GEAR TRANSMISSIONS
3. NON-REFLECTIVE OPTICAL COATINGS
4. LENSES, FILTERS, PRISMS, MIRRORS
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6. PLUG GAGES
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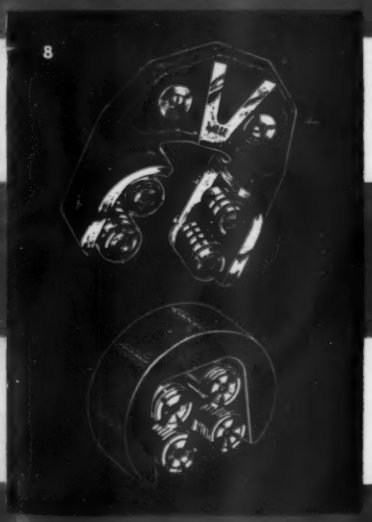
8. SNAP GAGES



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REPEAT ORDERS FROM WORLD FAMED MANUFACTURERS TESTIFY TO THE DEPENDABILITY OF THE MODERN LAKE SHORE PLANT AS A SOURCE FOR YOUR SPECIAL REQUIREMENTS IN ECCENTRIC FORM RELIEVED MILLING CUTTERS AND GEAR HOBS

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Back of every Lake Shore Tool are the facilities and skilled personnel of one of America's most completely equipped plants.

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TOOL WORKS
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Send us your blue prints for quotations on your high speed tool, special tool, and carbide production-tool requirements.

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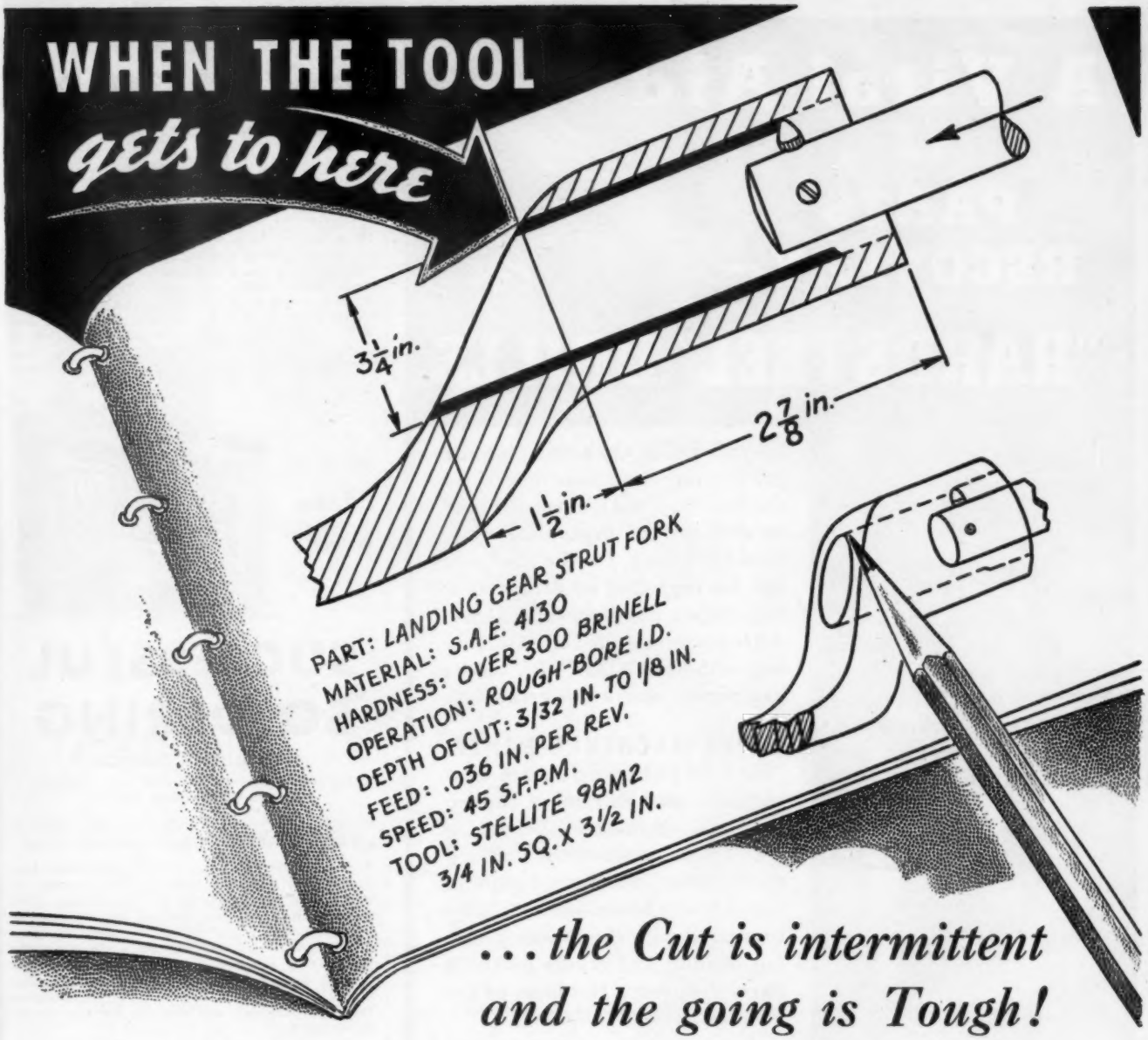
WHEN THE TOOL *gets to here*



. . . the Cut is intermittent and the going is Tough!

Rough-boring the I.D. of aircraft landing-gear strut forks of over 300 Brinell hardness . . . at the speed, feed, and depth of cut required to maintain schedules . . . is a severe test of the high-production qualities of cutting tools. This is particularly true during the 1½ in. of intermittent cutting, as sketched above.

Stellite 98M2 tools are standard on this job because they do the work in minimum floor-to-floor time, and at low cost per piece machined.

On many other steel machining jobs where a high rate of metal removal is required, Stellite tools are maintaining production schedules at low machining costs.

Write for the Stellite 98M2 Tool Price List. It describes the properties and available forms of Stellite standard tools. Information on Stellite *special* tools can be obtained from any District Office.

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Reg. U. S. Pat. Off.

HAYNES STELLITE COMPANY

Unit of Union Carbide and Carbon Corporation

New York, N. Y. UCC Kokomo, Indiana

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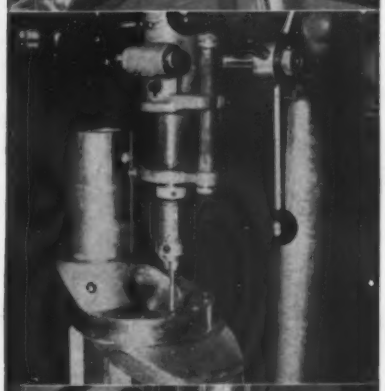
• HIGH-PRODUCTION METAL-CUTTING TOOLS •

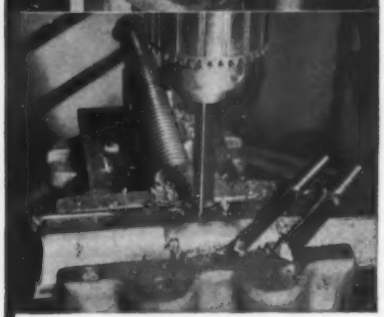
"Stellite" is a registered trade-mark of Haynes Stellite Company.

A Vital Aid to PARTS RECOVERY— "HARDSTEEL" DRILLS

SAVES DIES. On a crimping die for making aluminum mess trays for the Navy, the diemaker forgot to drill for the gage pins before final hardening. On the stamping die he neglected to drill a vent hole before the die was hardened. All holes were drilled after hardening with "HARDSTEEL" drills and two expensive dies were saved.



SAVES MACHINED PARTS. "HARDSTEEL" drills are now regularly used to remove broken taps in blind holes in Wright engine crankshafts without defacing the threads. This method requires only 2 to 2½ hours—saves 6 hours compared with the former grinding method and results in 100% parts recovery. Hardness of the taps is Rockwell "C" 60-65.



SAVES TOOLS. This big broach broke through the slot while in service. It was full high-speed steel—yet with "HARDSTEEL" drills it was found possible to drill three half-inch holes through the shank and the broach was quickly placed back in service.

"You Harden It . . . We'll Drill It"

Parts recovery saves labor costs, machine costs and critical material. Having "HARDSTEEL" drills on hand for emergencies may mean the difference between meeting a production quota and falling behind.

No charge for "HARDSTEEL" Operator's Manual telling how to drill steels hardened by any process.

BLACK DRILL CO., 1400 East 222nd St., Cleveland 17, Ohio

"HARDSTEEL"

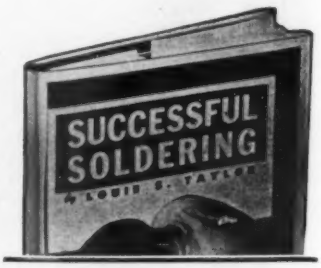
DRILLS · REAMERS · TOOL BITS · SPECIAL TOOLS

Learn HOW TO SOLDER

from this handy manual for the shop and home craftsman

Here at last is a brief, clear manual devoted solely to showing you how to get good results in the soldering work required on so many industrial, home craft, and repair jobs. For only $1.00 you can learn the answers to all your questions about soldering tools and techniques and have a constantly useful reference of pointers on any odd or special soldering jobs you may encounter.

just off the press!



SUCCESSFUL SOLDERING

By LOUIE S. TAYLOR

Assistant Professor of Industrial Arts Education, Santa Barbara State College

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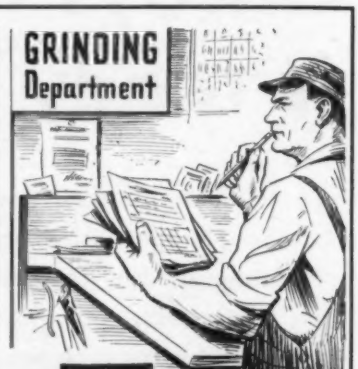

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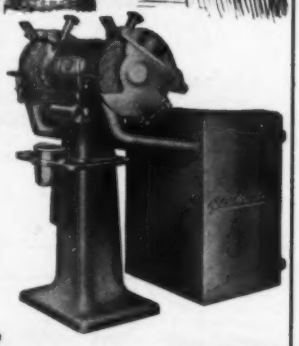

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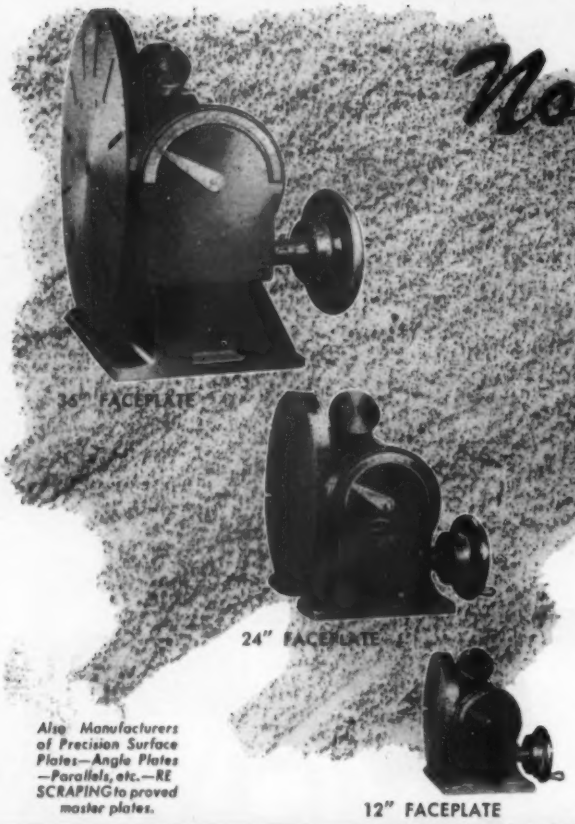

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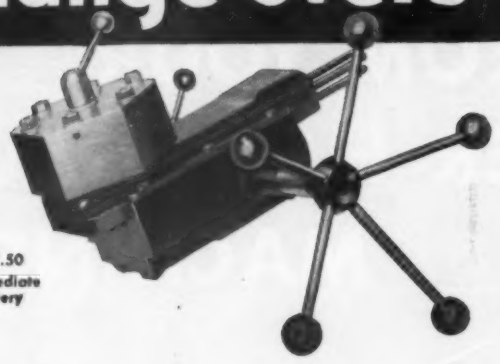

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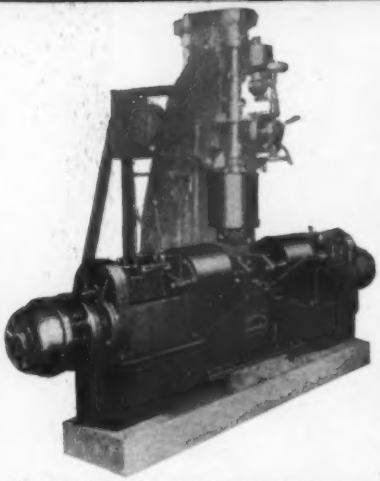
OFFER MANY PRODUCTION COMBINATIONS FOR INCREASING OUTPUT



EXAMPLE: Showing the possibilities of making a three-way high production machine using two units mounted on a base in connection with a standard heavy duty driller. The central electrical control and the regular power feed lever on the driller automatically start the feed of both units, which go through their required cycle and stop at return position. This unit drills 26 holes in three different planes in the time previously taken to drill the longest hole of the 26.

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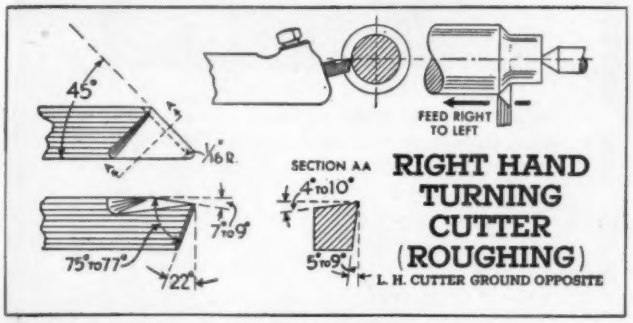
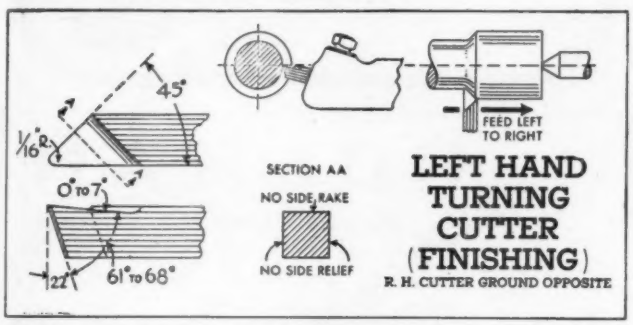
THE HOW AND WHY OF WILLIAMS DROP-FORGED TOOLS

GRINDING CUTTERS FOR WILLIAMS' TOOL HOLDERS . . . DATA SHEET F

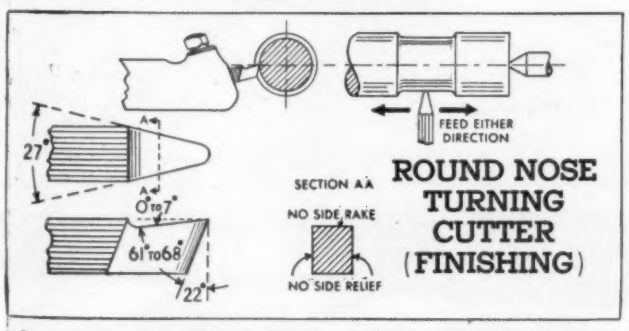
Covering various cutters used with Williams' Tool Holders in machining brass and bronze. Actual grinding (not applied) angles are given in each case. Sufficient latitude is indicated to accommodate the various compositions of brass and bronze — the softer the material the more acute the cutting angle.



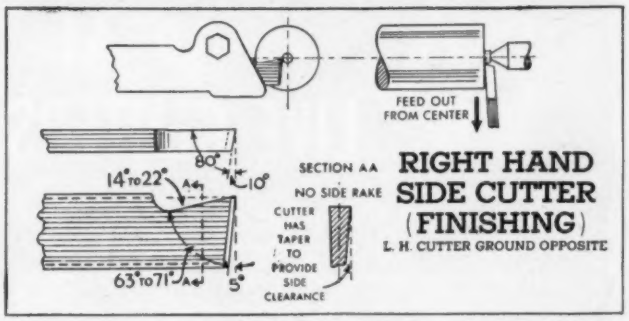
Above cutter is used with Williams' Turning-Tool Holders Nos. 000-S to 6-S, 000-R to 6-R and 000-L to 6-L.



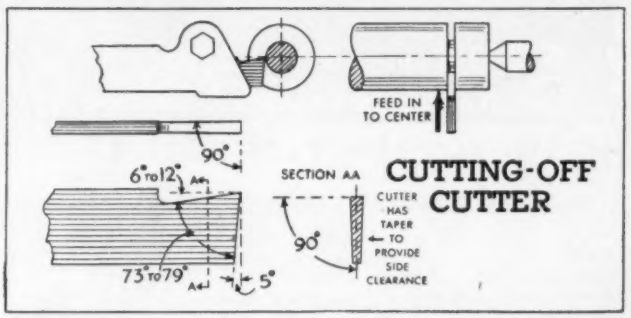
Above cutter is used with Williams' Turning-Tool Holders Nos. 000-S to 6-S, 000-R to 6-R and 000-L to 6-L.



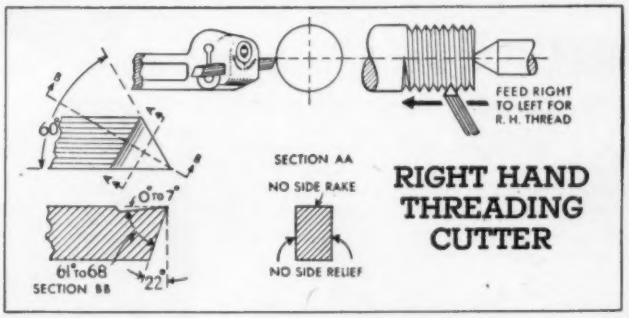
Above cutter is used with Williams' Turning-Tool Holders Nos. 000-S to 6-S, 000-R to 6-R and 000-L to 6-L.



Above cutter is used with Williams' Cutting-Off and Side Tool Holders Nos. N-020-R to N-25-R, N-030-R to N-35-R, and N-030-L to N-35-L.



Above cutter is used with Williams' Cutting-Off and Side Tool Holders Nos. N-020-R to N-25-R, N-030-R to N-35-R, N-030-L to N-35-L, NS-20 to NS-23, NS-30-RA and NS-30-R to NS-33-R.



Above cutter is used with Williams' Spring Threading-Tool Holders Nos. S-50, S-51 and S-52.

Data Sheets A, B, C, D & E on this subject have already appeared. Additional Data Sheets on grinding of other cutters for Williams' Tool Holders will follow. Reprints of Data Sheets are available on request, either punched and trimmed to fit standard 3-ring binder or plain for bulletin board use. Specify type wanted when ordering.

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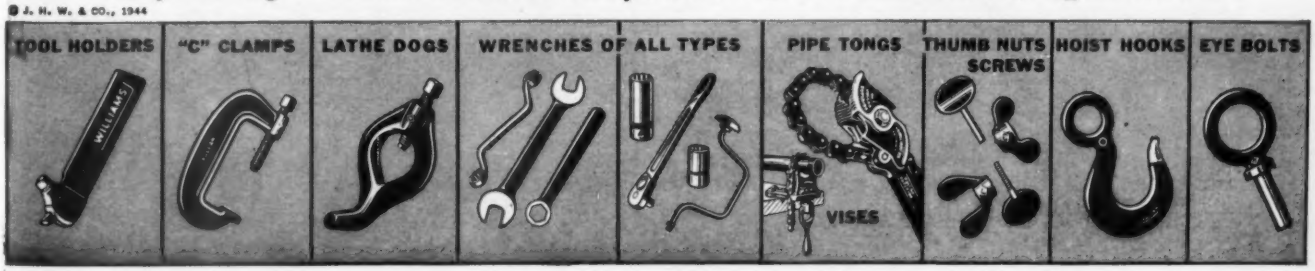

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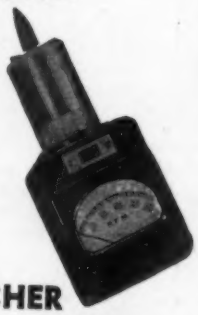

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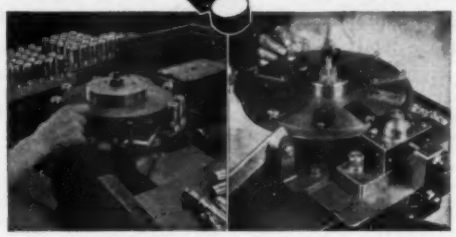

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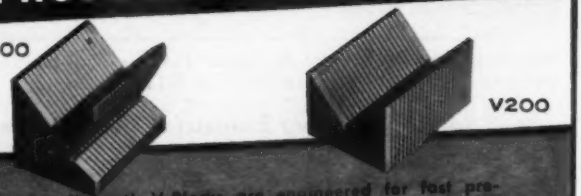

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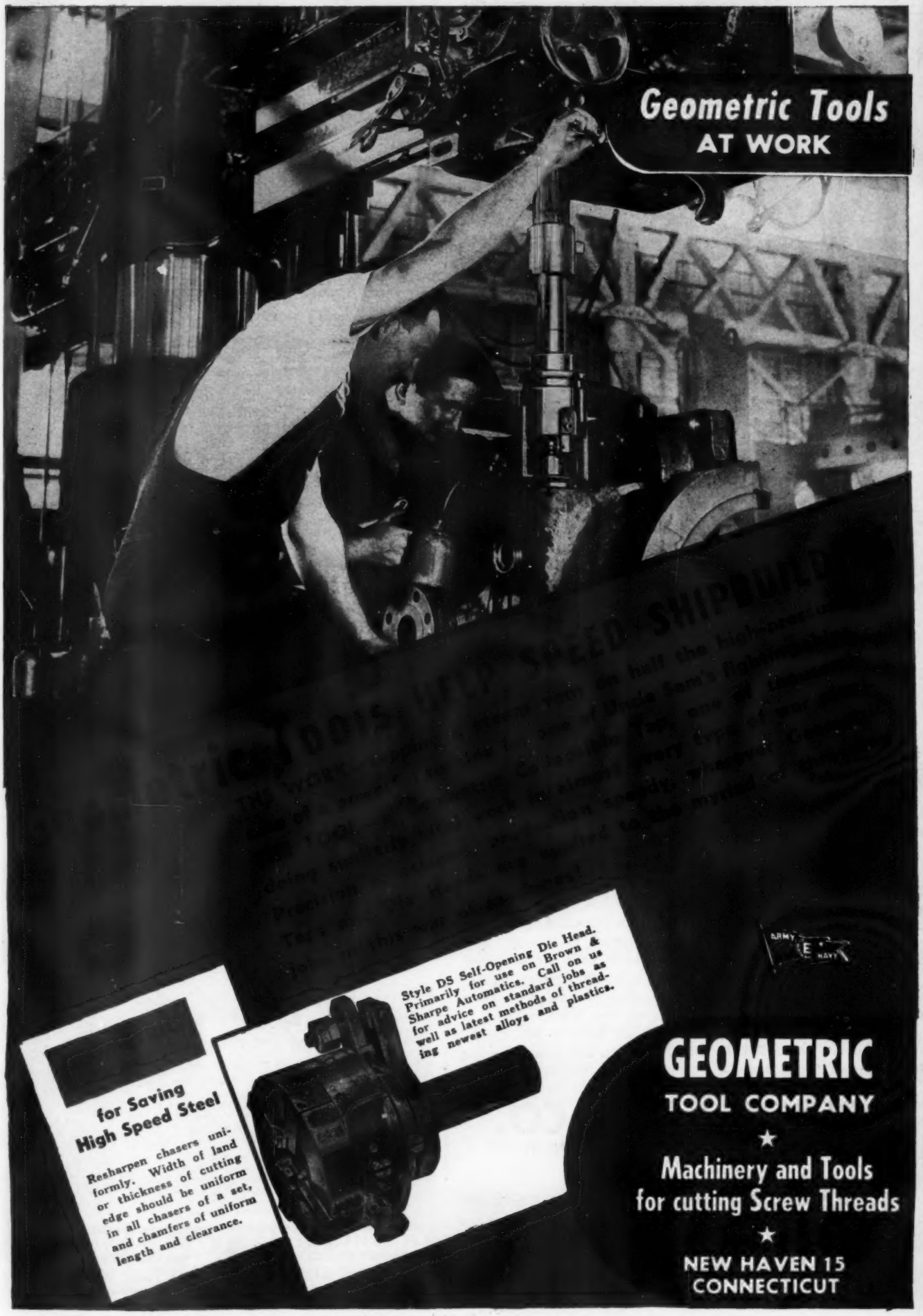
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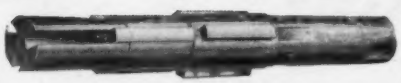

Bulletin No. 10-43

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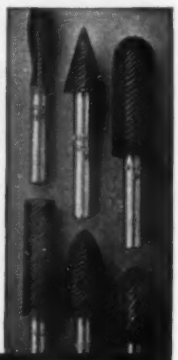
There is a GROBET ROTARY FILE in shape, size and coarseness of cut for every type of hard or soft metal, plastic, wood, etc. GROBET FILES do their jobs better and stay sharp longer.

Send for catalog DR, the most complete of its kind illustrating and describing GROBET Rotary Files, Diesinkers, Burs, Tube Burring Cutters, Chatterless, Countersink, etc.



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IMPORTERS OF GROBET SWISS FILES MFRS. OF GROBET ROTARY FILES

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CLECO RIV-N-JECTORS

Picture, courtesy of Douglas Aircraft

They reduce rivet dropping 90% or more. The Cleco RIV-N-JECTOR is a featherlight device comprising a magazine which holds 50-odd rivets—depending on length—combined with a mechanism by which rivets may be inserted in the hole and released, another rivet at the same instant being moved into position for inserting in the next hole. RIV-N-JECTORS are loaded by use of the electrically operated hopper illustrated.

RIV-N-JECTORS are made in three sizes: No. 1 for 1/16" and 3/32" rivets; No. 2 for 1/8", and some types of 3/32"; No. 3 for 5/32" rivets. All RIV-N-JECTORS carry lettered panels to show size, and are further identified by color bands corresponding to colors used for Cleco Sheetholders.

The whole story of RIV-N-JECTORS and loading hoppers is told in new Bulletin 89, sent upon request. Demonstration at your convenience—entirely without obligation, of course.

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3781 East 77th Street • Cleveland 5, Ohio
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FOR PRECISION GRINDING of HARDENED STEEL PARTS

FOR MILD STEEL SURFACING

Almost daily this 846-K-1 Dayton wheel makes new friends. Not every wheel can make and support that statement.

Some find the 846-K-1 Dayton particularly effective when surfacing mild steel—maximum removal of stock with little wear on the wheel.

Others find it equally suitable for precision grinding operations—excellent finish—high production.

Still others use it, not to surface some one material only, but to process a variety of materials—high production and long wear the invariable result.

It may be that you are puzzled over some surface grinding problem. It may be that a Dayton 846-K-1 would solve that problem. Why not find out? Outline that problem by letter, wire, or phone. A Dayton 846-K-1, or some other Dayton wheel perhaps, may solve it for you.

Dayton Wheels in all types and sizes for all grinding requirements.

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712 NEGLEY PLACE **DAYTON, OHIO**

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GRINDING WHEELS

Accelerating WAR PRODUCTION

Speed your output with Criterion Diamond Tools. The kind of service they give is responsible for the swift, steady increase in their use. Quality of diamonds employed plus a unique method of setting assure extreme rigidity and extra tool life. Special tools made to order following blueprints or specifications. Sharp-pointed, selected thread grinding tools. Ask your dealer or order direct. Request free literature.

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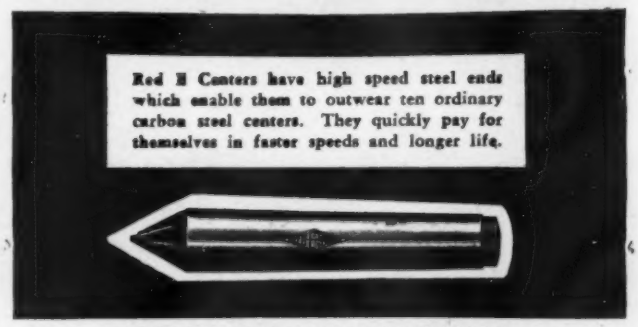
BEVERLY HILLS, CALIFORNIA

LONGER LIFE ASSURES LOWER COST


Red H Centers have high speed steel ends which enable them to outwear ten ordinary carbon steel centers. They quickly pay for themselves in faster speeds and longer life.

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IRANISTAN & R. R. AVES. BRIDGEPORT, CONN.

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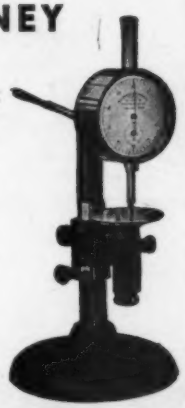
Universal Gauge

for rigid inspection of a wide range of parts . . .

An almost unlimited use is offered by this instrument for inspecting duplicate parts in quantity or any small parts with flat surfaces or recesses.
Use of standard blocks made possible by raising or lowering table increases capacity to take material up to 2" in height. Graduated to read to .001 inch; height 9¾"; weight 5 lbs., 1¼ oz.; depth from frame to spindle 1⅞".

Can be supplied with sliding head and table; also on a stand with throat 3" deep.



Full details on request

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Makers *Waltham, Mass.*

MASS production of interchangeable parts requires *faster more positive*, and *less personal* inspection. Gages such as these provide modern methods for controlling dimensions in *both* production and inspection. With a Dial Indicator Gage you *see*, quickly and positively whether the work dimension is correct. They require less trained skill to use than old fashioned type gages. For detail information write

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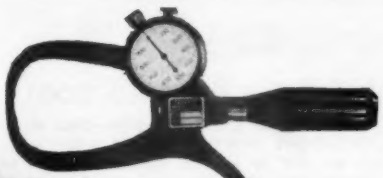
PROVIDENCE 1, R. I.

Left — THREAD GAGE. Checks pitch diameter faster, more positively than conventional gages. Adjustable for diameter.

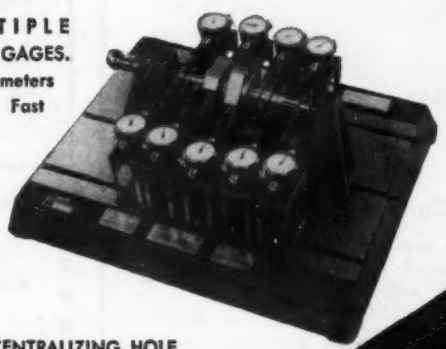
Left — SNAP GAGE. You can see with this gage faster than you can feel with a "fixed" gage.

Right—COMPARATOR. A sensitive instrument with fine adjustment for tool room or production use.



Above — CALIPER GAGE. A "handy" gage for various types of work such as patterns, cores, castings, plastics, bottles, etc. to specified dimensions.

Right — MULTIPLE INSPECTION GAGES. Checks nine diameters simultaneously. Fast and adjustable.



Left—CENTRALIZING HOLE GAGE. You can "explore" a hole for roundness, taper, shallow or high spots as well as diameter with this.

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CARBIDE TIPPED TOOLS
Price $1.00 Each In Any Size

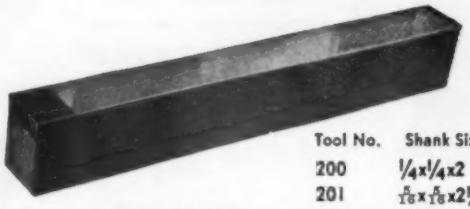
New Low Prices—Increase Production—
Cut Operating Costs

Tools are tipped with Tungsten Carbide, and are suitable for machining cast-iron, brass, bronze, aluminum, non-ferrous materials such as hard rubber, bakelite, fibre, and tough alloy steels up to 500 Brinell hardness

Left Hand-Reverse Image. Right Hand Shown

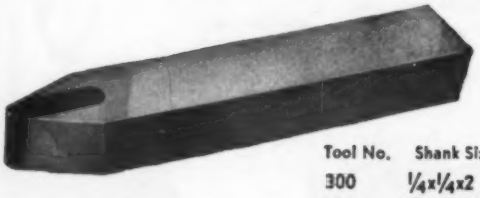
SERIES 100

Tool No. RH	LH	Shank Size
R-100	L-100	1/4x1/4x2
R-101	L-102	5/16x5/16x2 1/4
R-103	L-104	3/8x3/8x2 1/2
R-105	L-106	7/16x7/16x3
R-107	L-108	1/2x1/2x3 1/2



SERIES 200

Tool No.	Shank Size
200	1/4x1/4x2
201	5/16x5/16x2 1/4
202	3/8x3/8x2 1/2
203	7/16x7/16x3
204	1/2x1/2x3 1/2



SERIES 300

Tool No.	Shank Size
300	1/4x1/4x2
301	5/16x5/16x2 1/2
302	3/8x3/8x2 1/2
303	1/2x1/2x3 1/2

Standard Tungsten Carbide Tipped Tool Bits

In lots of 12 assorted in any Series; 100-200-300 Series an extra 10% will be allowed; also in lots of 50 assorted 20% discount will be allowed.

Sizes not listed as well as special TIPPED TOOLS will be quoted upon request. When ordering, state tool number and quantity desired.

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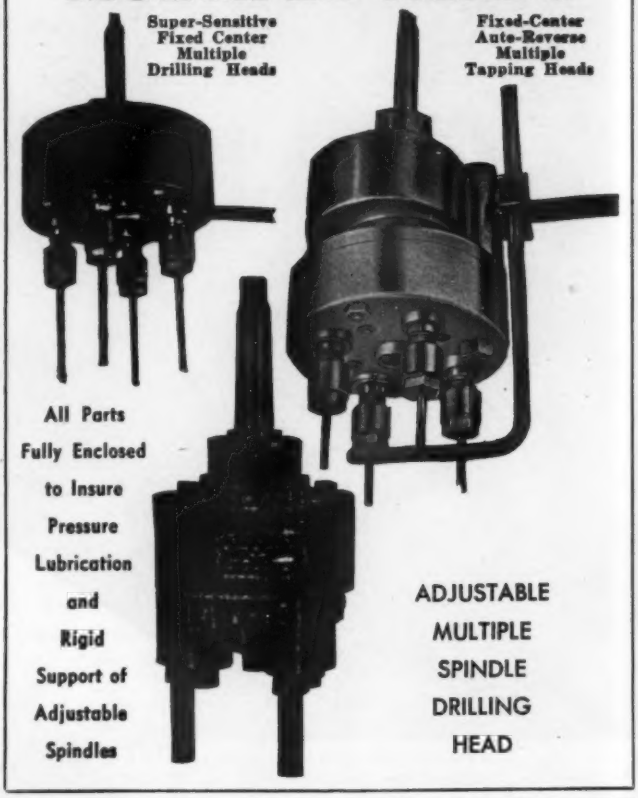
MULTIPLE HEADS

Super-Sensitive Fixed Center Multiple Drilling Heads

Fixed-Center Auto-Reverse Multiple Tapping Heads



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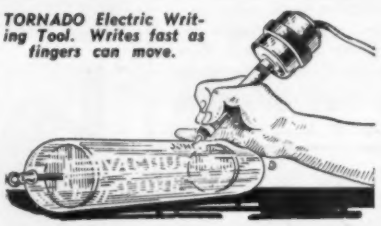
TORNADO Electric Writing Tool. Writes fast as fingers can move.



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TORNADO Electric Writing Tool is used for marking everything—brass, marble, tile, glass, plastics, wood, hard rubber, aluminum, steel and bronze.

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HARDNESS TESTER

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Here at A.C.E. we make specials by the dozen—instead of standard tools by the thousand. Naturally we have to know how to make all kinds of specials—make them accurately and economically, and maintain delivery schedules.

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SPECIALIZING IN HIGH SPEED CUTTING TOOLS TO YOUR PRINT

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THE POSSIBILITIES OF THE NATIONAL KEYSEATING MILLER *on Your Work*

Several widths of cutters can be used with each size miller and many different hole diameters keyseated with one tool through the use of eccentric bushings.

• Shops all over the country are solving difficult keyseating problems by chucking this attachment on their drill presses, radials and horizontal boring mills—and milling keyseats in pieces too large or bulky for convenient handling on keyseating machines.

The "National" goes through the hole once and mills keyseats with parallel sides and parallel with the axis of the bore. It's a big time and money saver and is available in standard stock diameters from ½" to 3½" for cutting lengths from 1⅞" to 12". It will keyseat in blind holes, taper holes, and offset holes. We also manufacture oil-grooving millers.

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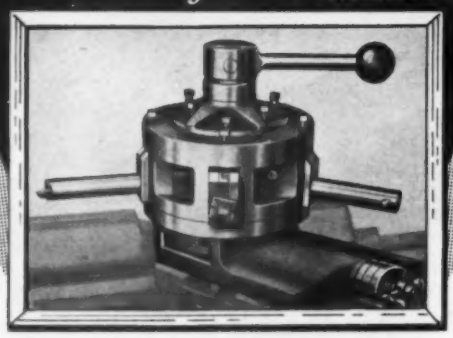
NATIONAL MACHINE TOOL CO.
CINCINNATI, OHIO

PORTRAIT *of* A TIMESAVER



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1 SAVE TIME 2

JUST A TURN AND A LIFT OF THE HANDLE BRINGS ONE OF FIVE TOOLS IN POSITION

THIS, WITH TEN ACCURATE INDEXED TOOL POSITIONS ALLOWS MINUTE ADJUSTMENTS

Time saved brings VICTORY that much nearer. Our NEW IMPROVED TURRET HEADS are built to take heavy cuts, and give precision service. Inexperienced help can quickly become fast operators with these NEW IMPROVED TURRET HEADS.

MADE UP IN FOUR INDIVIDUAL SIZES

For Lathes From 9" to 30" Swing — Write Today for Details

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GRINDING WHEEL DRESSERS

Desmond Cutters

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We manufacture a complete line of Dressers and Cutters. Write for copy of catalog "A".

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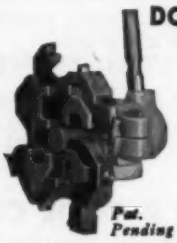

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CONVERT your engine lathe into a turret lathe in 15 seconds. To fit Bench lathes and lathes up to 20" swing. Designed to increase production. 6 DAYS DELIVERY.
The 4-Tool Tool-Post Turret is made in 2 sizes. The 5-Tool Tail-Stock Turret is made in 4 sizes. Also Adjustable Pull Feed—easily attached. All tools are precision attachments. Write for further details.

5-Tool Tail-Stock Turret

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"Jefferson Turrets are real production tools — substantial, rigid, accurate and adaptable to any size or make of engine lathes. They must not be confused with the small makeshift gadgets now on the market."

Also — Jefferson Precision Milling Machines, Milling Machine Dividing Heads, Vises, Belt Sanders, Swing Frame Grinders, Gyratory Foundry Riddles.

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SHEAR-CUT END MILLS

● Working hard to help make American armament the best and most powerful in the world, Progressive "Shear-Cut" End Mills are cutting clean, fast and long on the toughest jobs.

That's because they are precision made of the finest materials, to feed accurately, minimize chatter, give adequate chip clearance and uniform cutting action. Rigidly held, these End Mills will permit working to extremely close limits.

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Remember, the name "Progressive" has always and will continue, to signify "superior tools for superior work."

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For Surface Grinders

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HIGH SPEED
ATTACHMENTS
for
Surface Grinders

Nothing but praise when you use a Liberty High Speed Grinding Attachment for cutting those "difficult to get at" jobs.

Liberty Vertical Attachment, illustrated here, and the Liberty Horizontal Attachment are precision tooled for greater accuracy, and may be assembled to your surface grinder in 2 minutes without machining.

Their spindles are preloaded by an ingenious spring arrangement that guarantees perfect static and dynamic balance, and may be had with solid quill or collet chuck.

Grinding to close tolerances in blind end slot.

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Immediate Delivery From Stock

Precision Collets and Drawbars

For 10" Atlas & Logan, 9" South Bend ½" Capacity Lathes

It pays to specify *Precision* when collet work is indicated. Guaranteed unconditionally *Precision* products not only meet exacting standards of excellence, but may be had for immediate delivery.

And be sure to ask your dealer for the new *Precision* Lever-Type Drawbar. Practical men in the machine shops find it simpler to install . . . no holes to drill or tap . . . and built for superior performance. The sensational Coordinate Cam principle eliminates the need for bearings and fingers, resulting in easier operation and lasting construction. *Literature on request.*

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ADJUSTABLE LIMIT
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A Gage with Locking Cams which will stay set

Good Delivery

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Let the SCLEROSCOPE speed up the production of that s so we can blow the Axis to HELL

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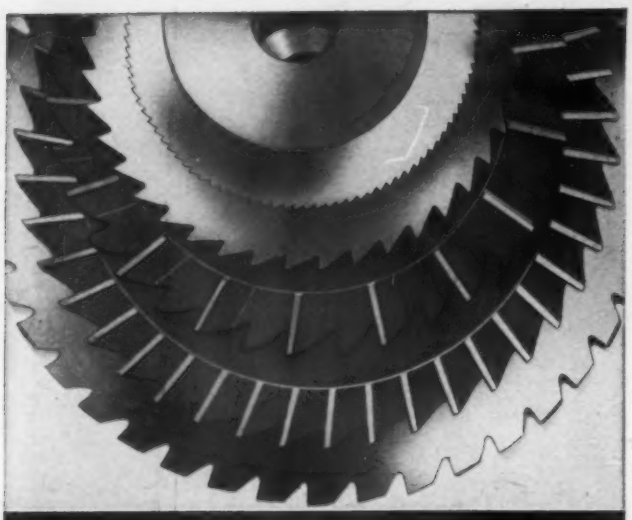
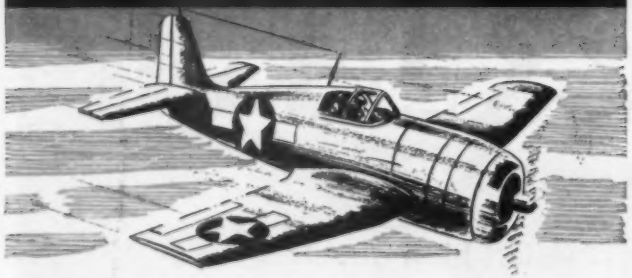


CIRCLE R Metal Cutting Saws

BUILT BY
PERFECTIONISTS
FOR
Exacting Operations

The Famous GRUMMAN HELLCAT



Circle R Saws and Grumman Hellcat fighters have this in common; both are made by perfectionists to accomplish today's difficult and exacting tasks.

R

CIRCULAR TOOL CO., Inc.

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PLASTIC FACES

now available

. . . as well as rawhide, copper or babbitt

The plastic material used for BASA Hammer faces is outstandingly tough and resilient, will not chip, split, or mushroom, and will outlast many other materials.

This new development still further extends its usefulness to many kinds of work.

BASA, you know, is the hammer in which the interchangeable faces can be replaced within a few seconds by merely loosening a single nut.

Write for Bulletin with complete information

BASA
REPLACEABLE FACE
HAMMER

GREENE, TWEED & CO. Bronx Boulevard at 238th Street, New York

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STEVENS
MILLING MACHINE
VISES

5 in., 6 in. and 7 in. sizes
All parts Interchangeable

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The GLENNY *Adjustable-Expansion* BROACH

Produces low cost, accurate keyways. Eliminates set-up time. Self aligning. Interchangeable parts. Adapted for arbor press, mechanical or hydraulic pressure. Speeds up production. Cutter bars in carbon or high speed steel. Details? Write!

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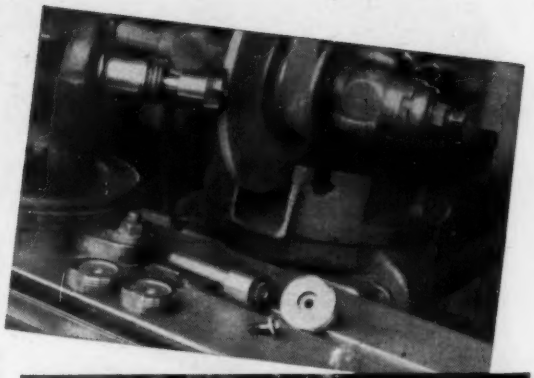
Multi-Point, Multi-Set, Multi-Edge, and Single Set. Diamonds for All Industrial Purposes.

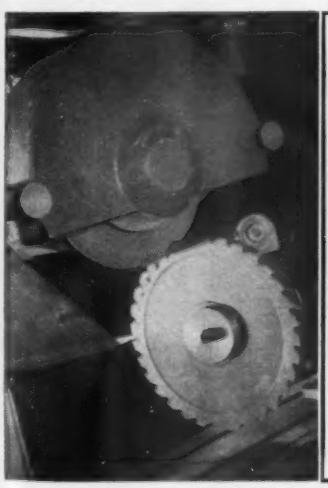


HERE'S HOW TO DO IT...

and use grinding wheels wisely, too!

TO keep war production up to quota, industry needs tools, lots of them—and lots of grinding wheels to keep them sharp. There's enough steel and abrasives to do the job—but only if every man on a grinding wheel uses the proper procedure in sharpening tools. Otherwise precious steel is wasted, and grinding wheels are used up too fast. Here are a few rules to remember that will help you "treat 'em right."

Every hour this war is shortened will save $12,000,000. The lives it will save are priceless. Let's get it over with — quickly.



Use the correct wheel for the job. It is essential that the correct grain type and size, structure and grade and the proper bond be used. The Carborundum Representative will be glad to help make your selection.

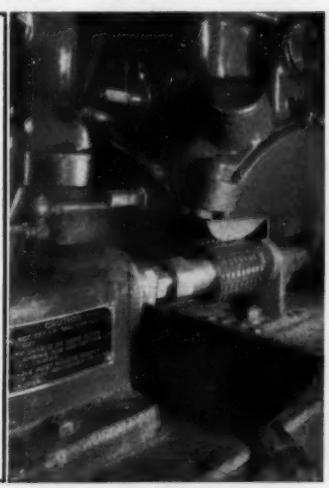
Keep grinding wheels sharp. Dress frequently with the proper dressing tool.

Sharpen tools frequently. Don't wait until they are very dull. You may waste tool steel by taking off too much stock and lose production. Sharpen them after a specific number of cuts—even if they don't seem to need it.

Control tool form. Proper tool performance can only be obtained by maintaining correct rake and clearance.

Use light grinding pressures. You may burn the tools. Edges may become soft from overheating.

Use the right equipment. Use only machines for reconditioning tools which are designed for the job.



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REG. U. S. PAT. OFF. BRAND

ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

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MANUFACTURERS OF GRINDING WHEELS, COATED ABRASIVES, SUPER REFRACTORIES, HEATING ELEMENTS

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)

A Precision Fixture for Grinding both right and left hand screw machine tool bits to any desired chip breaker angle.

MACHINE CAPACITY WITH BOYAR-SCHULTZ DEPENDABLE SCREW MACHINE TOOLS

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Boyar-Schultz Screw Machine Tools are d... for ... pacity and are built with the strength to maintain that capaci... maxim... uracy.

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Whatever YOUR requirements—however unusual the cutting operation—you can be sure of getting the precise tool you need if it is . . .

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METAL CUTTING TOOLS
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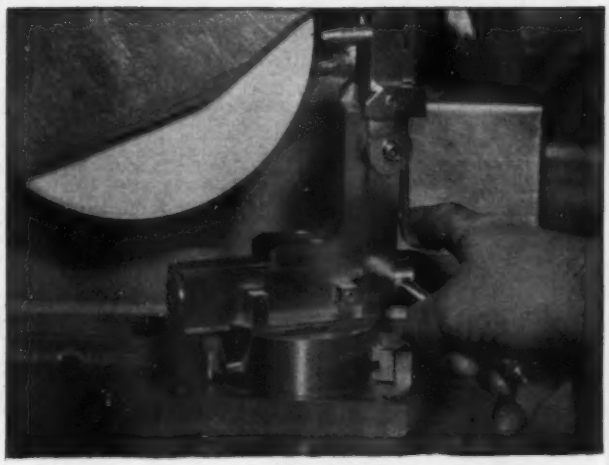
A RADII & ANGLE DRESSER

OF PRECISION AND VERSATILITY



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SAVE GRINDING WHEELS

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INCREASE GRINDING PRODUCTION EFFICIENCY

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New Improved GRINDING WHEEL DRESSERS and CUTTERS

• Tested and proved in actual service, VINCENT - HUNTINGTON Grinding Wheel Dressers and Cutters will aid you in maintaining the accuracy and efficiency of your grinding wheels.

Note the close-up of the business end of a Huntington Grinding Wheel Dresser. The cutters are made of *high-carbon tool steel* — precision milled — and heat-treated by the famous "Vincent Process" to assure you the accuracy so essential for War Production Grinding.

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DIE HEADS

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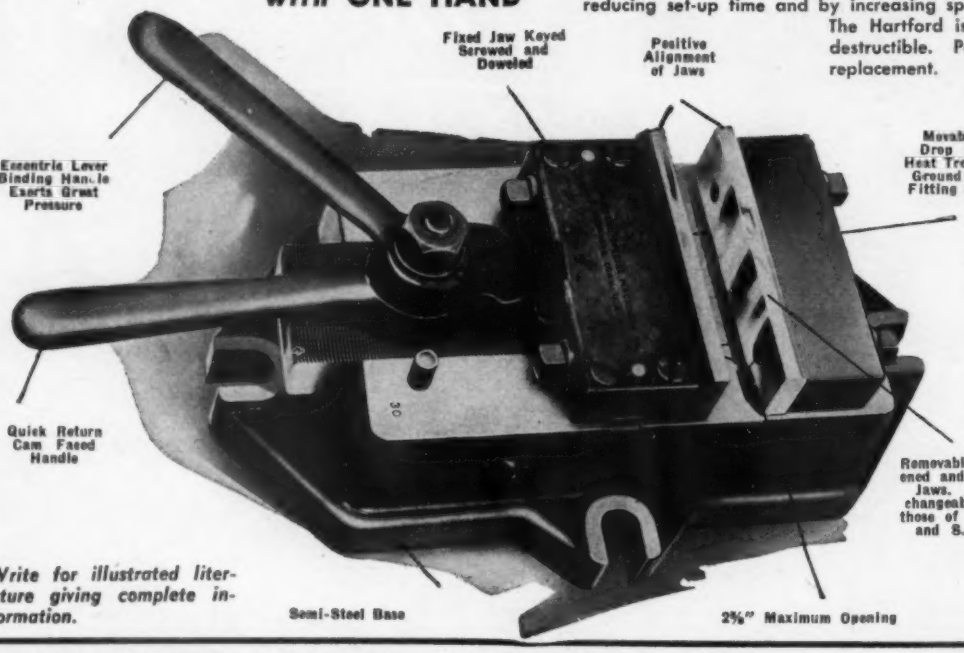
The Hartford is accurate and practically indestructible. Parts are interchangeable for replacement.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Positive Alignment of Jaws
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Removable Hardened and Ground Jaws. Interchangeable with those of No. 2B and S. Vise
Semi-Steel Base
2⅝" Maximum Opening

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For firmly gripping drills, keyway cutters and end mills, you can't beat Universal Collet Chucks. Universal Chucks don't marr tool shanks yet grip as strong as solid steel itself. The chuck shown here has National Milling Machine taper shank. Also available are Universal Standard, Floating, and Centering chucks. Write Universal today for complete facts.

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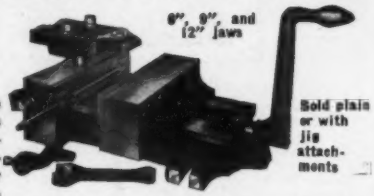
Handling a Wide Variety of Work—



Handles wide variety in two respects: first, its various sizes suit practically every type of machine from heavy planer and shaper work, through milling, radial and grinding, to light drill press work; second, its special jaws, stops, guides, etc., suit it to holding innumerable shapes for single or repeat-operation work, with accurate positioning due to flush, parallel and square construction. A great time-saver in taking the place of special jigs and fixtures.

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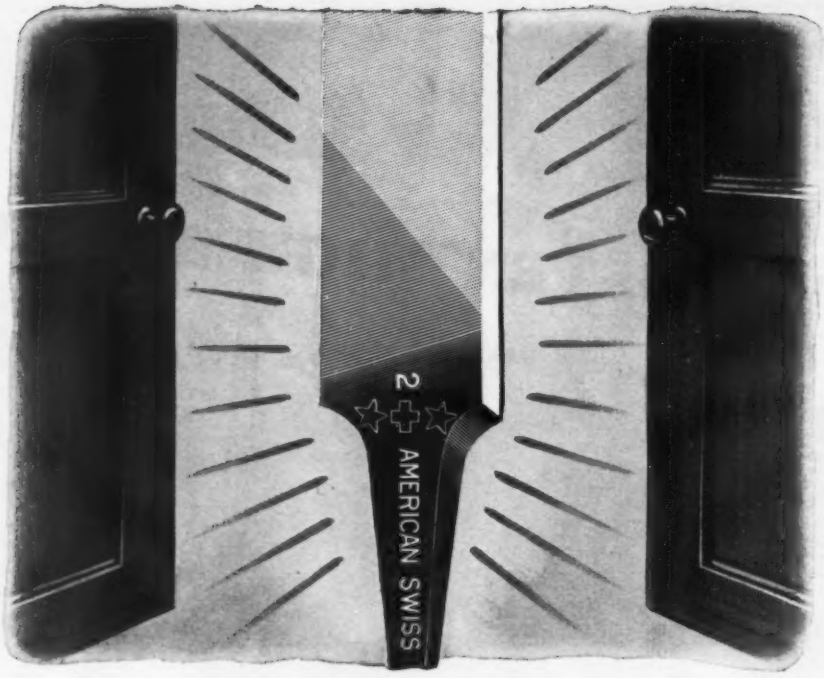

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FINISHING FILE

A SWISS-PATTERN FILE FOR *GENERAL* WORK

This type of Swiss-Pattern file should be a recognized and valued friend to you, because of its helpfulness in many kinds of general filing work. However, we find that its usefulness is not as widely known as that of other types of Swiss-Pattern files, so we are directing your attention specifically to it.

The Finishing (or Stripping) File is really a big brother to the Pillar File, for it has the same rectangular section and parallel width, with double-cut sides and safe edges. Its comparatively heavy proportions and its large sizes (8-in., 10-in. and 12-in. lengths) make it particularly suitable for general filing and on lathes.

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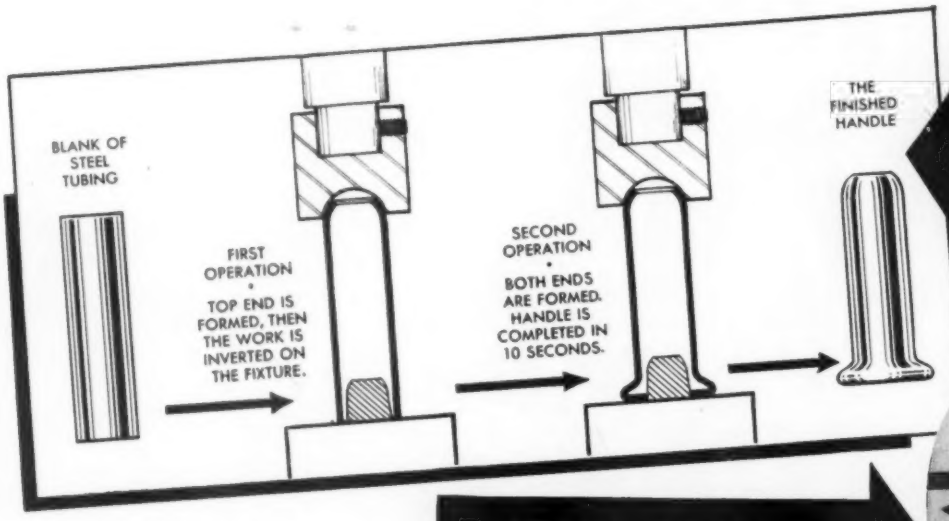
KRW HYDRAULIC PRESSES

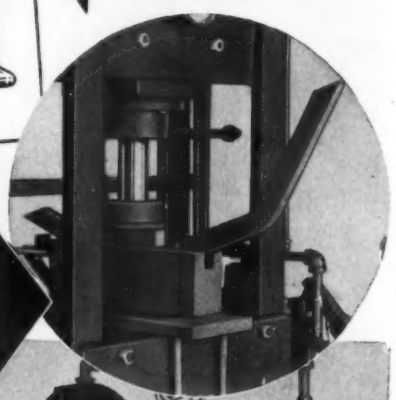
SPEED-UP MANUFACTURING OPERATIONS

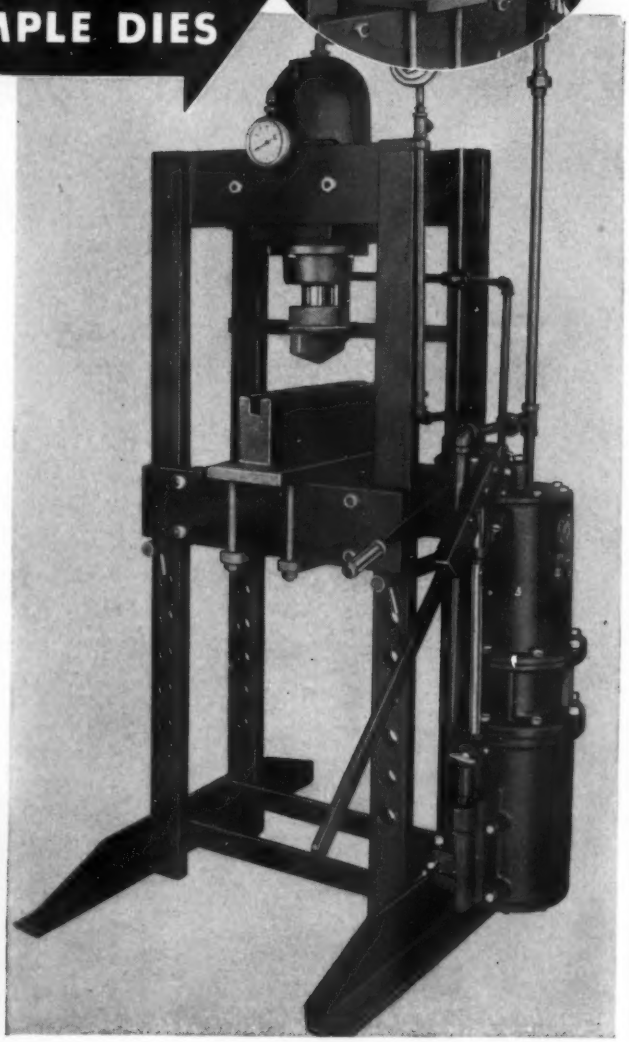

BLANK OF STEEL TUBING
FIRST OPERATION
TOP END IS FORMED, THEN THE WORK IS INVERTED ON THE FIXTURE.
SECOND OPERATION
BOTH ENDS ARE FORMED. HANDLE IS COMPLETED IN 10 SECONDS.
THE FINISHED HANDLE

HANDLE GRIPS FORMED IN 10 SECONDS

Both of these jobs are formed on the Special 50-ton KRW Press illustrated lower right. Ram is raised and lowered by an Air Booster which operates the hydraulic oil pump. Press can also be operated manually with the long hand lever.

STEEL TRUSSES COLD FORMED WITH SIMPLE DIES





● **Many bending, straightening, flattening, offsetting, assembling and other operations can be performed on KRW Standard and Special Presses by the use of simple, inexpensive dies. The two examples given here are actual manufacturing procedure in our own plant. Press trusses are cold bent from a bar of SAE 1035 steel, 1″ x 1¼″, which is bent edgewise.**

KRW Hydraulic Arbor Presses provide the ultimate in *speed* and incorporate many exclusive features which particularly adapt them to many manufacturing operations. Standard Presses are made in 25, 50, 60 and 75-ton capacities. Special Presses, providing KRW advantages, can be designed to order. Write for our Press bulletin or for engineering assistance on any special problem.

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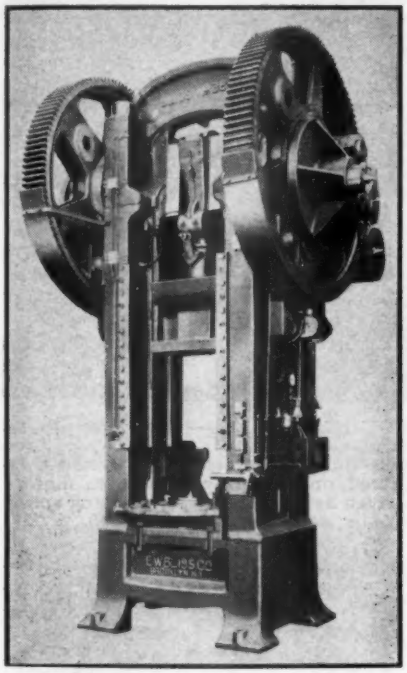
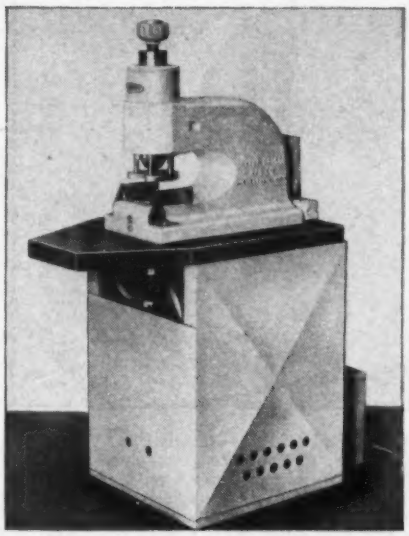
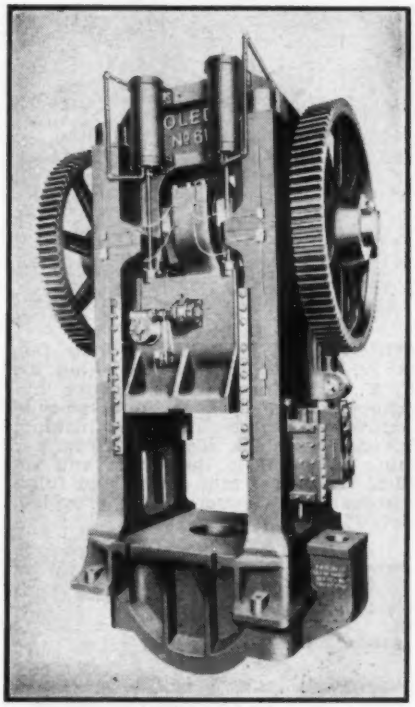
PRESSES, FORGING and MOLDING MACHINES



REDUCING PRESS—*E. W. Bliss Co., 53 St. & Second Ave., Brooklyn 32, N. Y.* No. 88-A mechanical press features quick return drive, which increases speed of machine on redraw operations. Speed of the press is 14 strokes per min. Capacities of the press are slide stroke, 34 in., slide face area, 18×29½ in.; bed area is 36×25 in. and a six-station dial feed is provided. Sept. 30, 1943, p. 118.

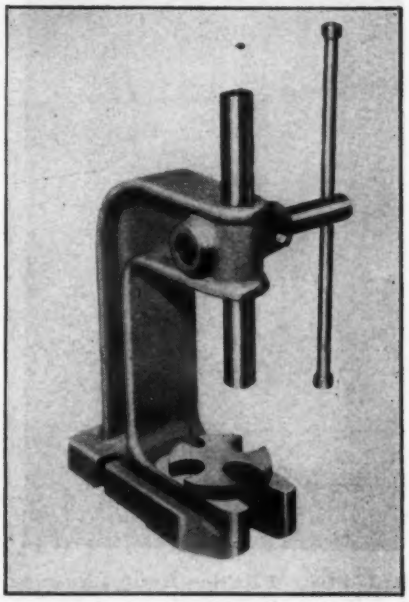


PIERCING PRESS — *Dayton Rogers Mfg. Co., 2835 12 Ave. S., Minneapolis, Minn.* Capacity of this automatic electric unit is from 12 to 14 in. It may be used for holes from 0.015 to 1⅛ in. July 22, 1943, p. 129.

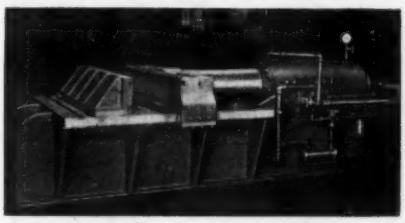


TRIMMING PRESS—*E. W. Bliss Co., 53 St. & Second Ave., Brooklyn 23, N. Y.* This 2,000 ton machine, with 24-in. stroke, is capable of trimming the average run of forgings from a hammer of approximately 33,000 lb. capacity. Oct. 14, 1943, p. 145.

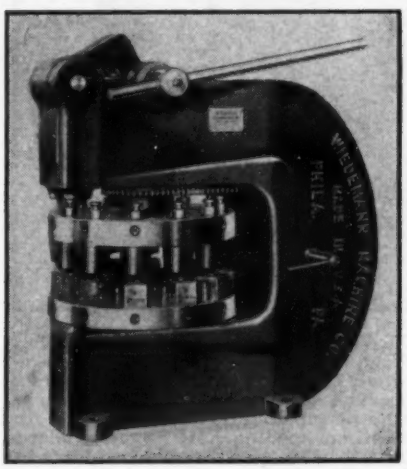
PRESS — *Ferracute Machine Co., Bridgeton, N. J.* Various light operations such as forming, piercing, riveting, stamping, can be handled on this foot-operated press. Sept. 16, 1943, p. 138.



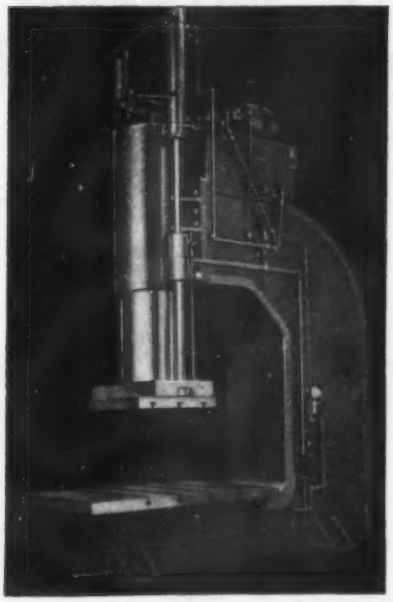
ARBOR PRESS — *Lempco Products, Inc., 5682 Dunham Rd., Bedford, Ohio.* Work up to 14 in. diameter can be handled in this press. Provides up to 3 ton pressure. May 13, 1943, p. 142.



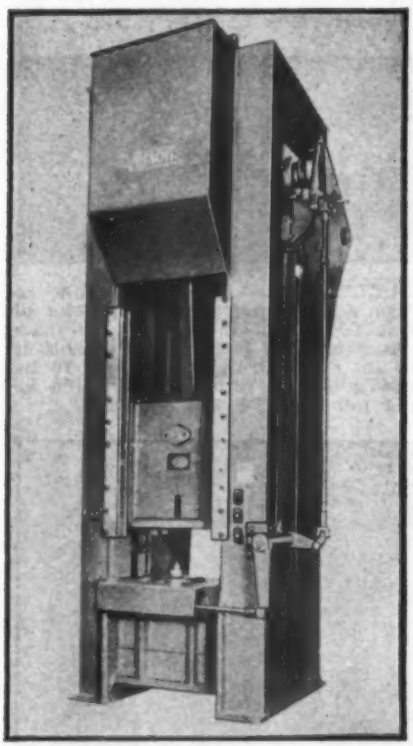
BULLDOZER — *Beatty Machine & Mfg. Co., Hammond, Ind.* Stroke of this 200-ton machine is 36 in., and maximum opening is 60 in. The table is 60 in. long. Pressing speed is 20 in. per min. and return speed is 60 in. per min. Mar. 4, 1943, p. 128.



PUNCH PRESS—*Wiedemann Machine Co., 1815 Sedgley Ave., Philadelphia, Pa.* This hand-operated turret punch press is available in two types for short run piercing of sheet metal. The 12-station machine carries punches and dies up to 1¼ in., and the 11-station up to 2¼ in. Both units develop 15,000 lb. pressure. Nov. 11, 1943, p. 140.

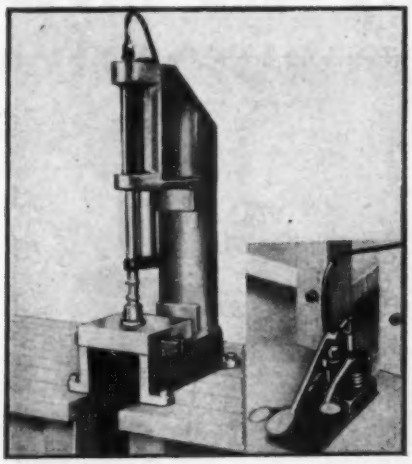


JOGGLING PRESS—*Beatty Machine & Mfg. Co., Hammond, Ind.* Capacity of this self-contained hydraulic press is from 5 to 350 tons. Dec. 9, 1943, p. 118.

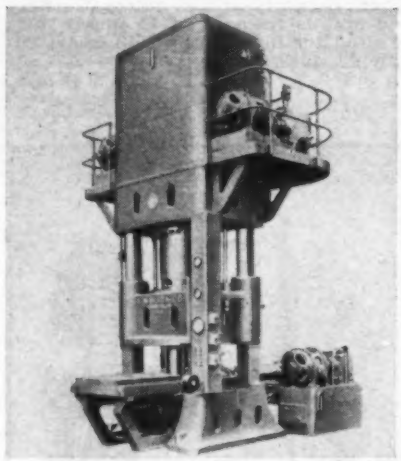


DRAWING PRESS—*Verson Allsteel Press Co., 9306 S. Kenwood Ave., Chicago, Ill.* This eccentric-type press produces both brass and steel cases of all sizes up to 105 mm. It is used for drawing, heading, tapering and piercing. It operates at 15 strokes per min. June 10, 1943, p. 138.

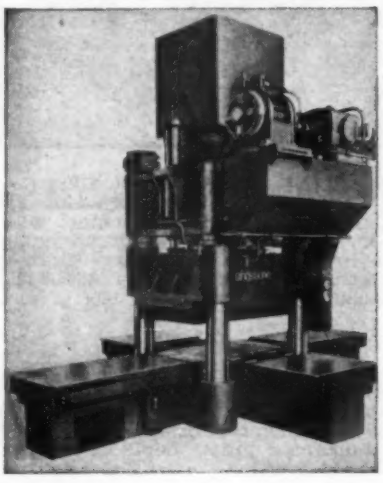
PRESS—*Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.* This hydraulic airplane press has four separate loading platforms to permit uninterrupted operation. Manual control is available for set-up, try-out and special work requirements. Apr. 15, 1943, p. 129.

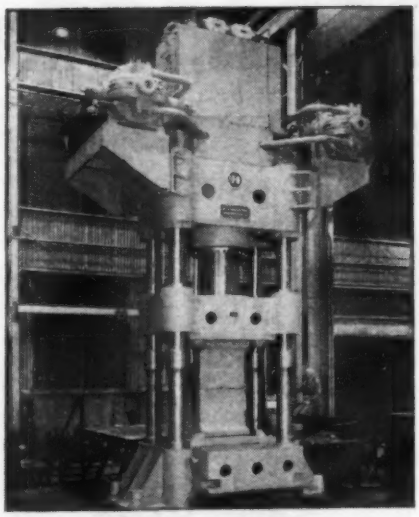


ARBOR PRESS—*Studebaker Machine Co., 9 S. Clinton St., Chicago, Ill.* This hydraulic Speedpress, with pressures up to 20,000 lb., operates by pedal pressure and handles work 15¾ in. diameter; has ram stroke of 7 in. Apr. 1, 1943, p. 113.

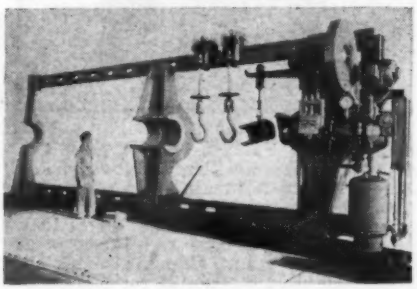


FORGING PRESS—*E. W. Bliss Co., 53 St. & Second Ave., Brooklyn 23, N. Y.* A feature of this 1100-ton hydraulic forging press is the drum-type control for reciprocation and inching. Speeds are: quick advance, 750 in. per min.; press, 37 in. per min., and return, 725 in. per min. Semi- and fully-automatic press operation is provided. Oct. 28, 1943, p. 121.

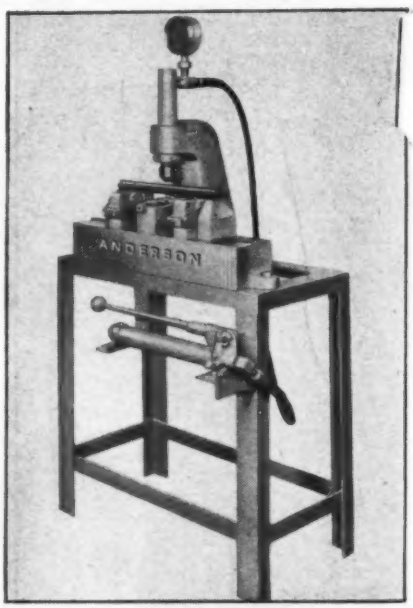




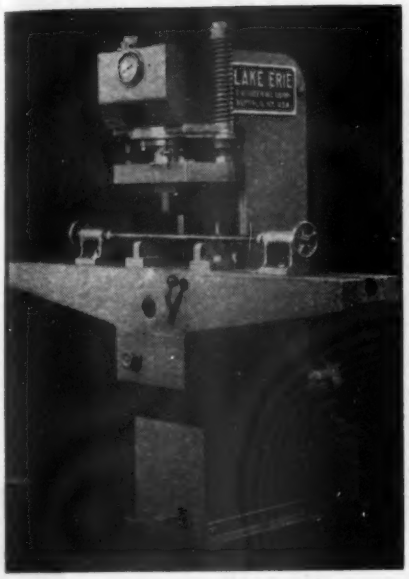
FORGING PRESS—*Hydraulic Press Mfg. Co., Mount Gilead, Ohio.* The 1,000-ton Fastraverse press is self-contained, open forging press with motor-driven hydraulic pumps; pressing speed 105 in. per min. Mar. 18, 1943, p. 132.



WHEEL PRESS—*R. D. Wood Co., Philadelphia, Pa.* This 600-ton wheel press is hydraulic in operation and has a ram travel of 26 in. It is built with a pneumatic pull-back device which makes it unnecessary to provide pit for counterweights. Oct. 14, 1943, p. 154.

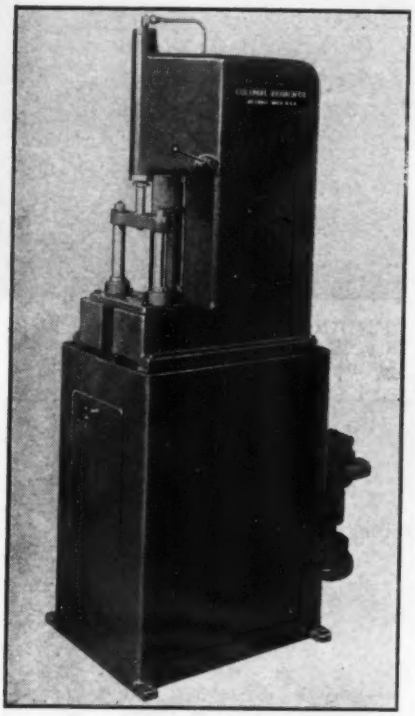


HYDRAULIC HAND PRESS—*Anderson Bros. Mfg. Co., 1907 Kishawaukee St., Rockford, Ill.* The Model HP-010 press checks and bends shafts, while in the same position. With a capacity of 20,000 lb., it handles work up to 1½ in. diameter. Apr. 1, 1943, p. 122.

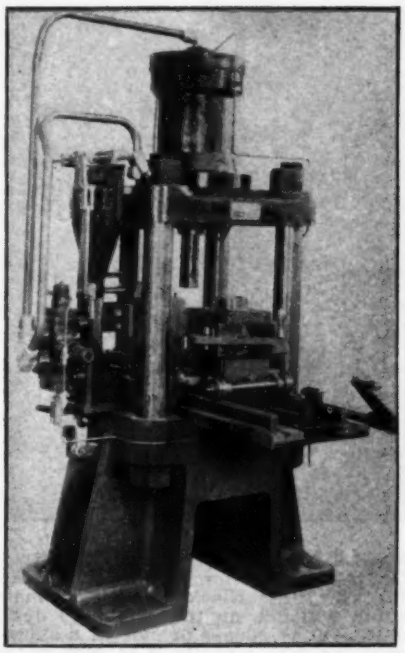


STRAIGHTENING PRESS — *Lake Erie Engineering Corp., Buffalo, N. Y.* This quick-acting shaft straightening press has hand and foot control. Its capacity is 20 ton. Feb. 4, 1943, p. 118.

←



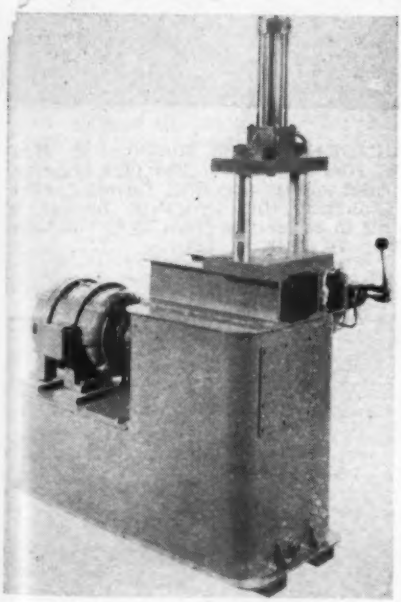
HYDRAULIC PRESS — *Colonial Broach Co., Detroit 12, Mich.* The improved Junior machine is made in this base type model in addition to a bench model. Stroke is adjustable to maximum of 12 in. Aug. 5, 1943, p. 130.



HYDRAULIC PRESS—*Hydraulic Machinery, Inc., 12825 Ford Road, Dearborn, Mich.* The Model K series is available in 25, 75, and 100 ton sizes; adaptable in capacities up to 150 ton. May 13, 1943, p. 138.

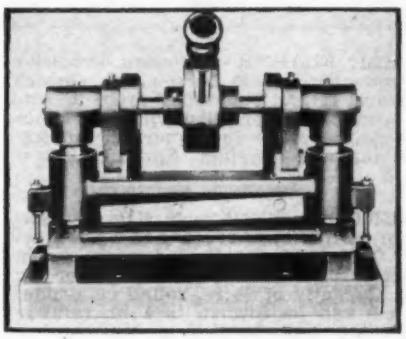
←

PRESS—*Hydraulic Press Mfg. Co., Mt. Gilead, Ohio.* Maximum pressure capacity of this self-contained H-P-M Fastraverse deep drawing press for sheet metal is 750 tons; equipped for drawing large, deep metal airplane parts. Maximum opening is 114 in. Feb. 18, 1943, p. 140.



←

ARBOR PRESS—*Hydraulic Machinery, Inc., 10421 Grand River, Detroit, Mich.* This is a six-ton hydraulic machine with 8 in. maximum stroke, 20 in. daylight opening and opening of 20 in. from left to right. Feb. 4, 1943, p. 118.

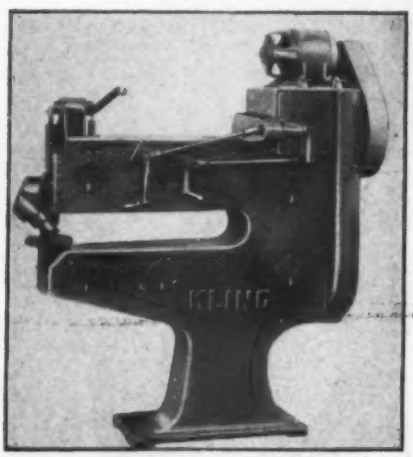


NIBBLER — *National Machine Tool Co., Racine, Wis.* The hand-operated No. 5 Handnib combination nibbling, shearing, drillrod cutting and punching machine for sheet metals, cuts templets and blanks to any shape. The unit can cut drillrod to ⅜ in. diameter and punch ½ in. holes in ⅛ in. flat stock. May 13, 1943, p. 140.

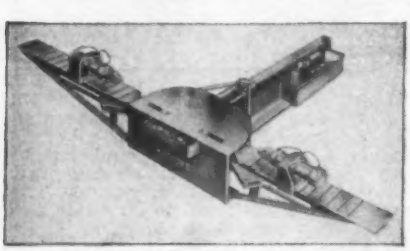
←

SHEAR—*O'Neil-Irwin Mfg. Co., Minneapolis, Minn.* Precision work on light and medium metals can be handled on this hand-operated shear. Has maximum shearing width of 9 in. on 22 gage sheet steel. July 22, 1943, p. 136.

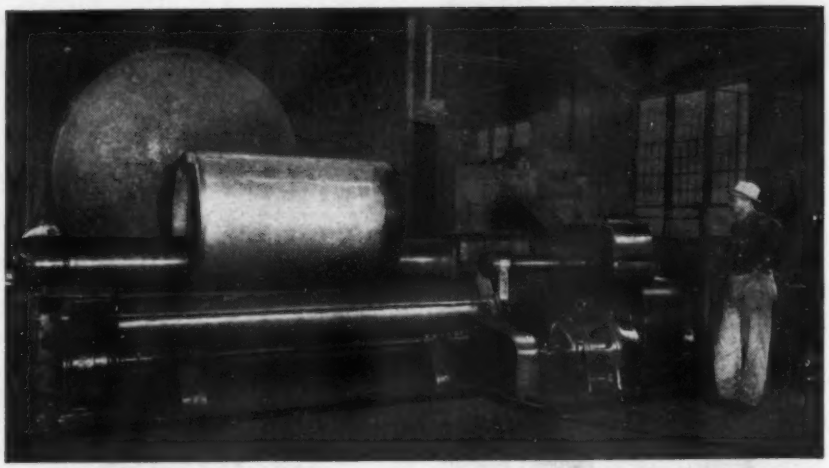
ANGLE NOTCHER—*J. F. Kidder Mfg. Co., 368 Colchester Ave., Burlington, Vt.* The Little Blacksmith No. 43 machine will cut up to 5x5 in., 90 deg. notch out of corner or side of a sheet with one cut; capacity is 14 gage mild steel, 10 gage aluminum. Apr. 29, 1943, p. 128.



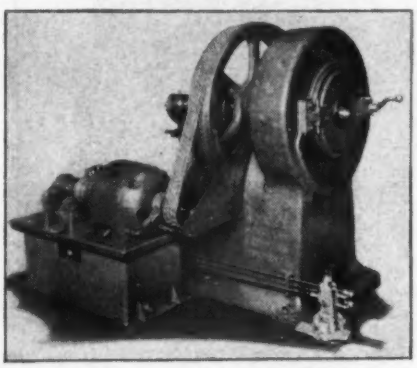
ROTARY SHEAR—*Kling Bros. Engineering Wks., 1300 N. Kostner Ave., Chicago, Ill.* This is an all-purpose shear which cuts plate up to 1 in. thick, and is suited for straight lines, openings, circles, and odd shapes. Apr. 29, 1943, p. 126.



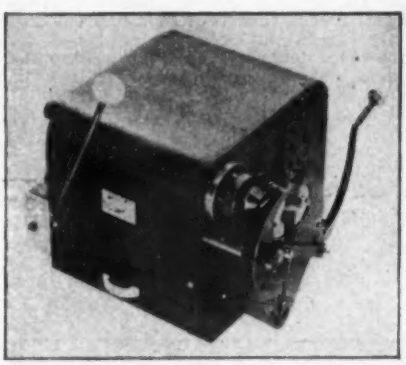
BENDING MACHINE—*Hufford Machine Wks., Inc., 315 Diamond St., Redondo Beach, Calif.* Extruded, rolled and flat strips of any shape and many materials can be handled in this bending and beveling machine. Pieces with cross-sections up to 7x7 in. between 12 and 200 in. can be formed. Mar. 4, 1943, p. 126.



BENDING ROLL—*Webb Corp., Webb City, Mo.* Plate 10 ft. 2 in. long and 1¼ in. thick can be rolled into 30 in. diameter circle with this equipment. Dec. 9, 1943, p. 117.

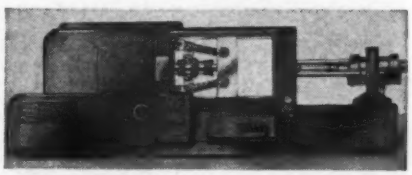


HYDRO-FORMER—*Standard Machinery Co., Providence, R. I.* Three sizes of this machine for joining and shaping tubing and rod, hose and cables are available. The small bench machine has manually actuated wedges, but the larger sizes are hydraulically actuated. Six basic work combinations can be performed. June 21, 1943, p. 126.

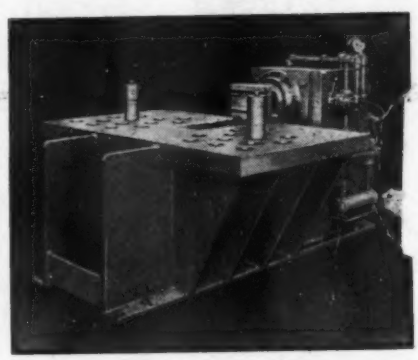


TUBE FLARER—*Leonard Precision Products Co., 1100 Larson Ave., Garden Grove, Calif.* Tube sizes from 3/16 to 1½ in. can be handled with this bench model machine for squaring, burring, flaring and heading. Apr. 15, 1943, p. 140.

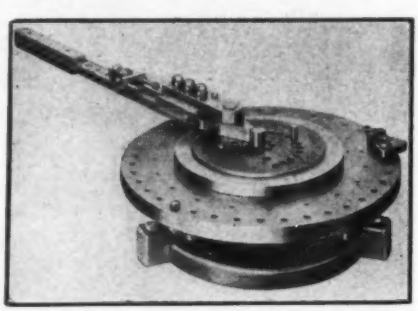
BENDER—*O'Neil-Irwin Mfg. Co., Minneapolis, Minn.* Accuracy to a tolerance of 0.001 in. in duplicated work can be obtained with the Di-Acro bender No. 3. Capacity of ½ in. round cold-rolled steel can be formed to 1 in. radii or greater. Oct. 14, 1943, p. 156.



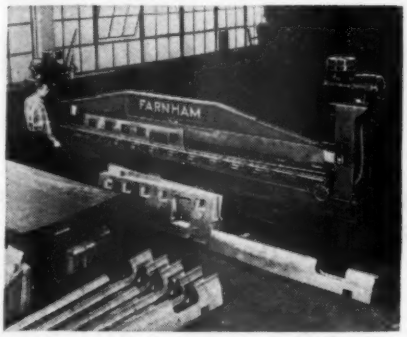
DIE CASTING MACHINE — *Reed-Prentice Corp., Worcester, Mass.* Operation of this large capacity High-pressure cold chamber machine is either manual or semi-automatic. Die plates 30x30 in. and between 12 and 24 in thick can be handled. Dec. 9, 1943, p. 122.



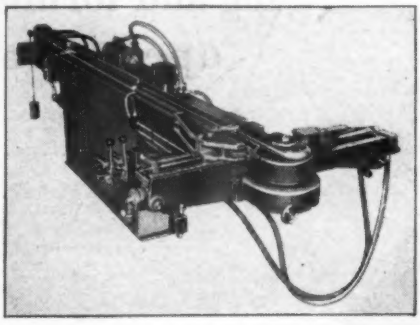
BENDER—*Beatty Machine & Mfg Co., Hammond, Ind.* For pipe bending, straightening, pressing, forming welded shapes, this hydraulic bender is built in capacities from 35 to 200 tons Sept. 16, 1943, p. 125.



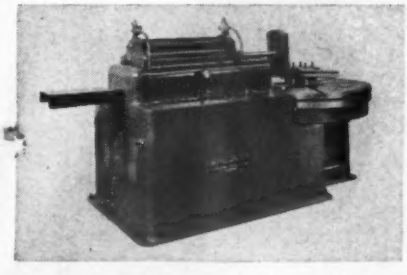
PRESSES, FORGING and MOLDING MACHINES



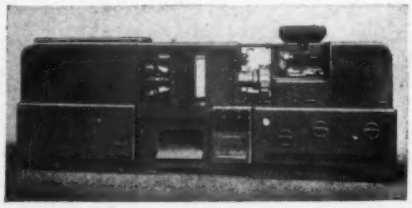
ROLLING MACHINE—*Farnham Mfg. Co., 2061 S. Park Ave., Buffalo 20, N. Y.* Curvature and tapers in thin metal sheets that have been cut and drilled may be formed at the same time in this machine. Dec. 23, 1943, p. 121.



BOOSTER ATTACHMENT — *Pines Engineering Co., Aurora, Ill.* Hydraulic bending machines made by this company now include a booster attachment in the form of a separate cylinder through which the mandrel rod passes. This permits bending to radii that allow stretching metal to its maximum elongation. June 24, 1943, p. 126.



BENDING MACHINE — *Cyril Bath Co., E. 70 & Machinery Ave., Cleveland 8, Ohio.* Straight sections can be formed to the desired radius by either compression forming or stretch forming with the contour bender, available in several sizes. Oct. 14, 1943, p. 148.



INJECTION MOLDING MACHINES — *Reed-Prentice Corp., Worcester, Mass.* Two large plastic injection molding machines added to the line are available in 16 and 22 oz. per shot sizes. Nov. 25, 1943, p. 126.

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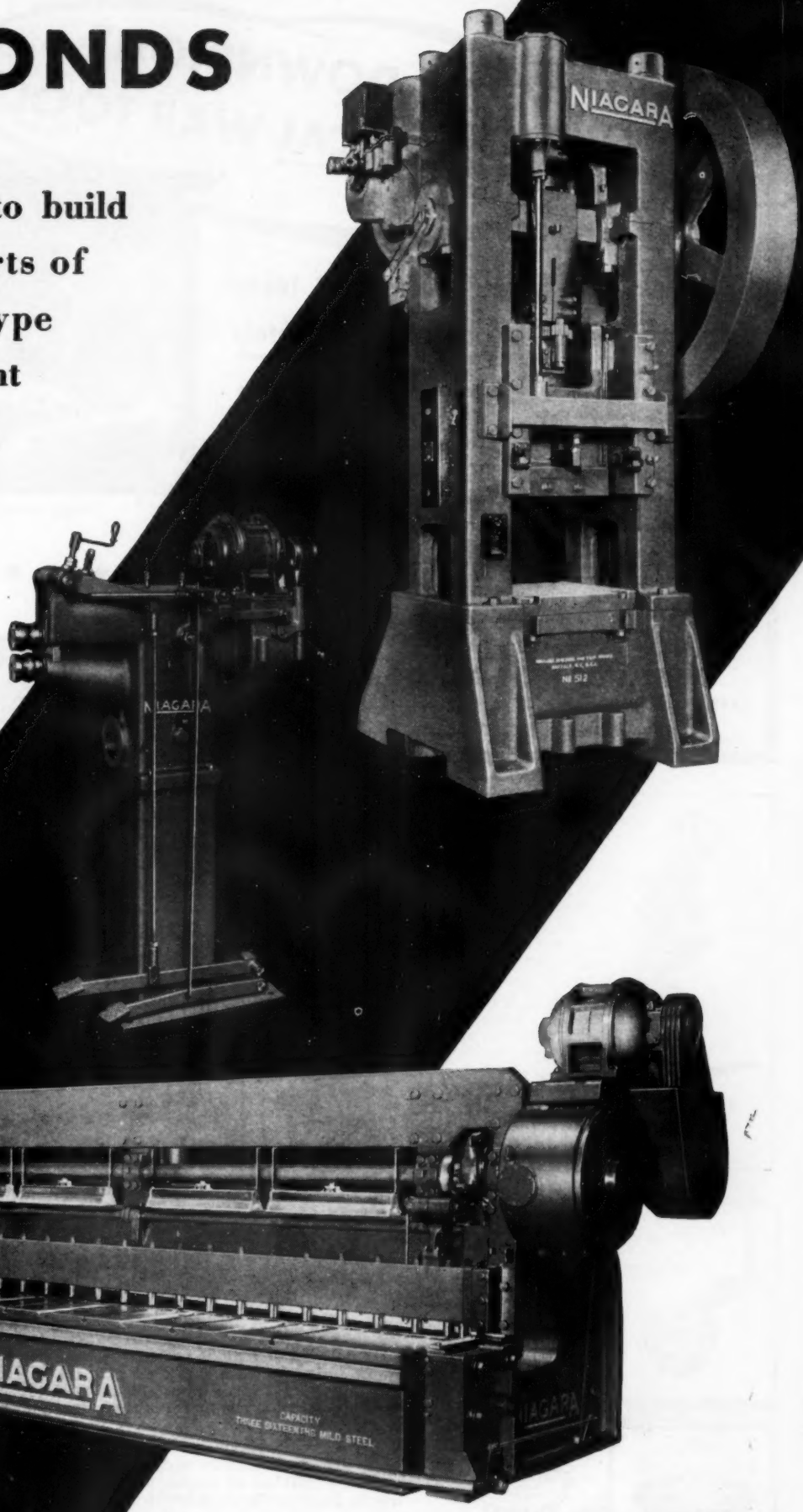

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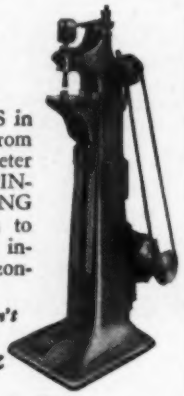

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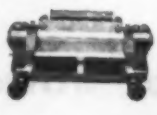

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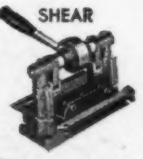

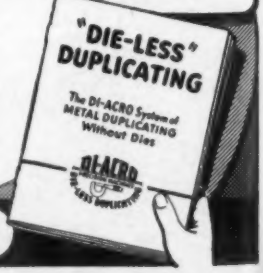

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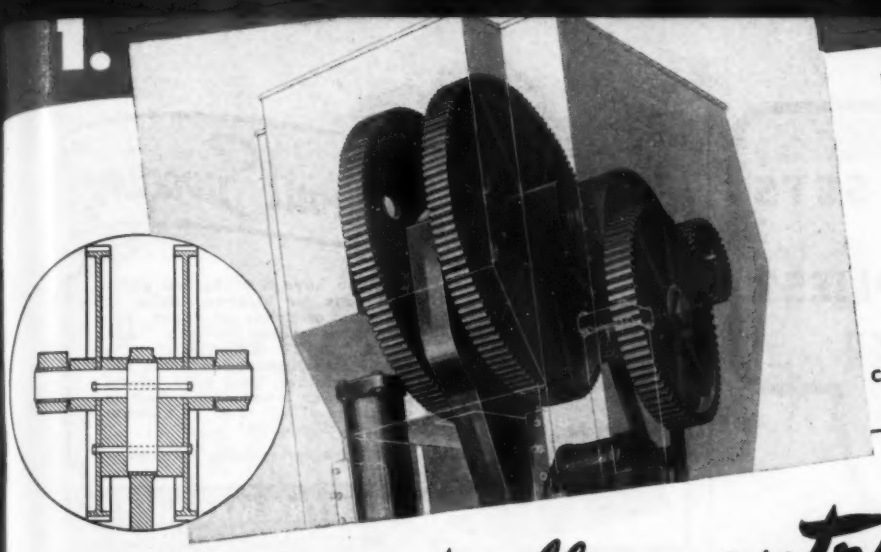

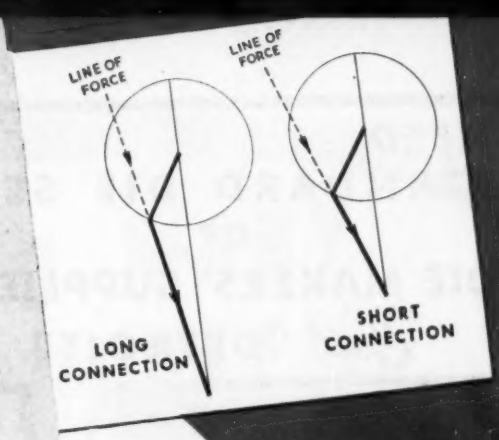

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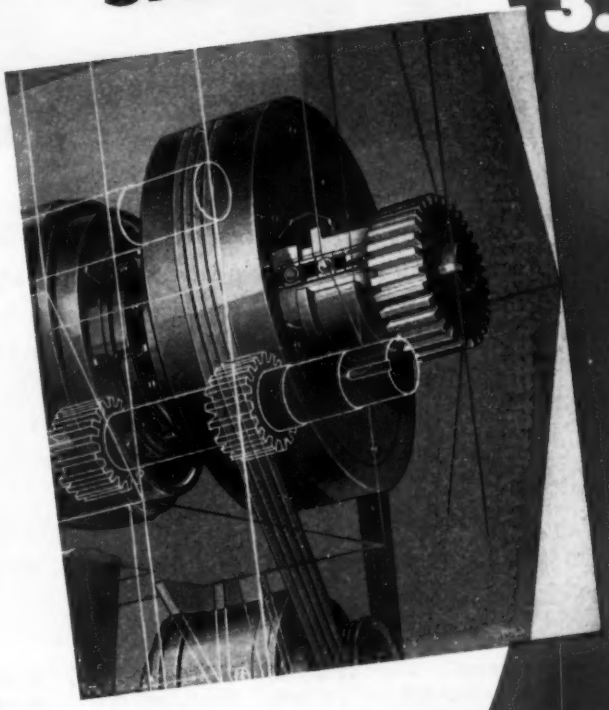

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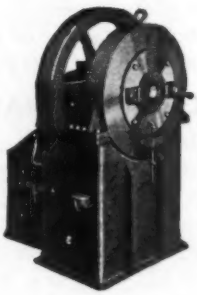

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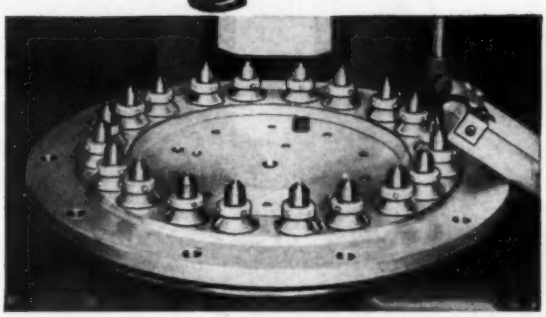

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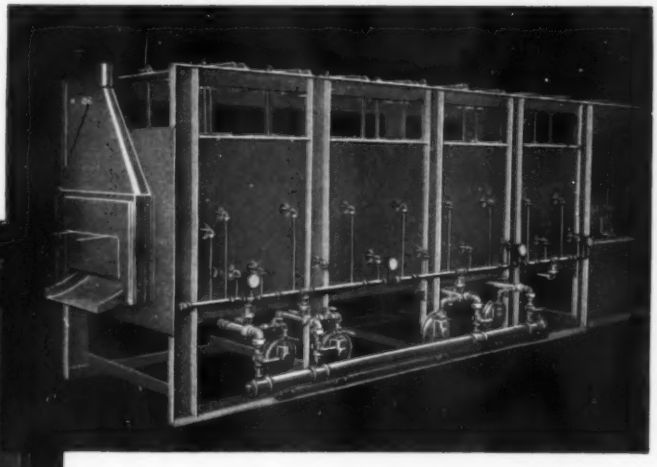
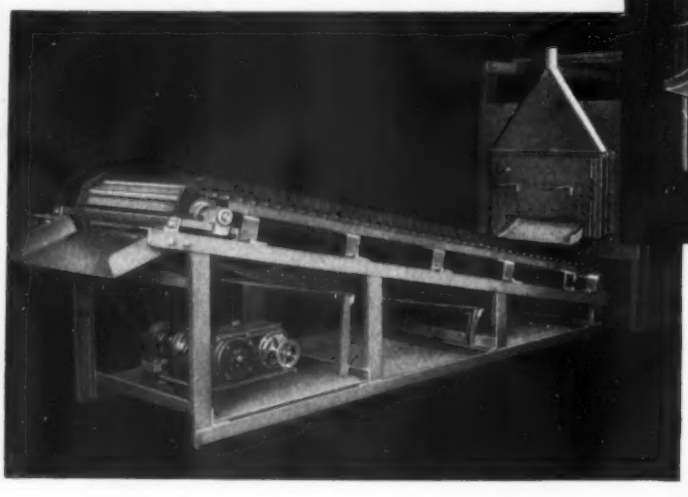
Versatile A. G. F. furnaces and heating machines did not have to be altered to fit into the War Production Program. Similarly, alterations will not be involved when we are back on a peacetime basis.





Normalizing rifle receivers at the rate of 1000 to 1200 pounds per hour is the present job of this Heating Machine and Cooling Conveyor. Subsequently, it can be used for normalizing peacetime forgings or hardening bolts, nuts and hand hardware of all descriptions.

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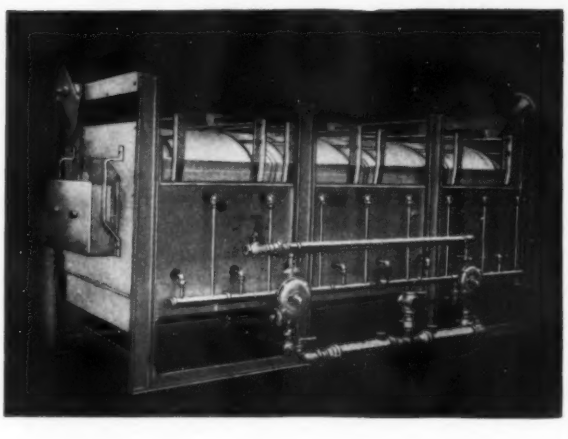

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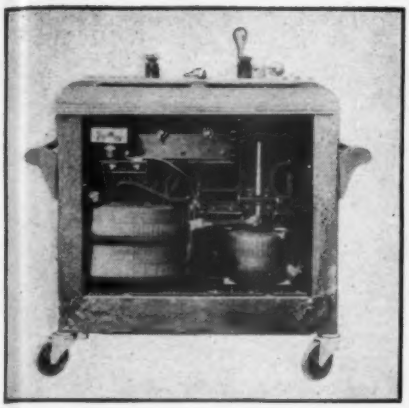
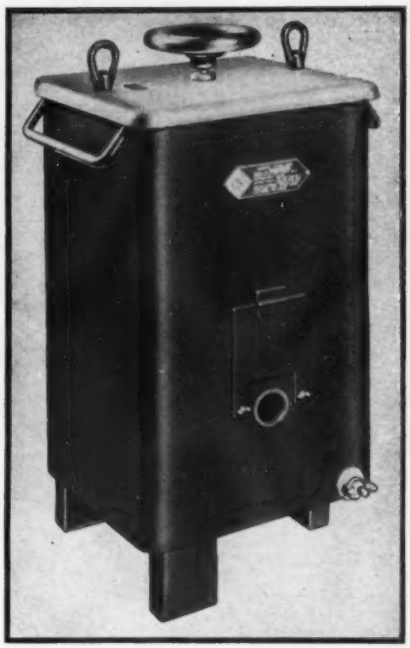
WELDING, HEAT-TREATING, CLEANING and FINISHING



ARC WELDING MACHINE—*Hampton Electric Mfg. Co., 314 Archie St., Oakmont, Pittsburgh, Pa.* This Model G a.c. machine designed for general use, operates on 220 or 400 volts and has a capacity of from 30 to 300 amp. Apr. 29, 1943, p. 122.

ARC WELDER—*Harnischfeger Corp., Milwaukee, Wis.* Heavy and intermittent duty machines show actual minimum to maximum output of usable welding current. Available in eleven sizes. June 24, 1943, p. 138.



WELDER—*General Electric Co., Schenectady, N. Y.* Automatic voltage control for reducing output voltage to less than 35 volts is a feature of this outdoor a.c. equipment. It has a range of from 100 to 625 amp. at 40 volts. Aug. 19, 1943, p. 129.

WELDER — *Glenn-Roberts Co., 1009 Fruitville Ave., Oakland, Calif.* Adaptable for hand or automatic operation, this heavy-duty transformer type a.c. welder has two open circuit voltages. Output ranges from 100 to 675 amps. Aug. 19, 1943, p. 131.

WELDER — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* The Ampac 200 a.c. welder provides automatic voltage for the continuous range of currents available. Can use most direct current rods. Output ranges from 30 to 250 amp. June 24, 1943, p. 132.

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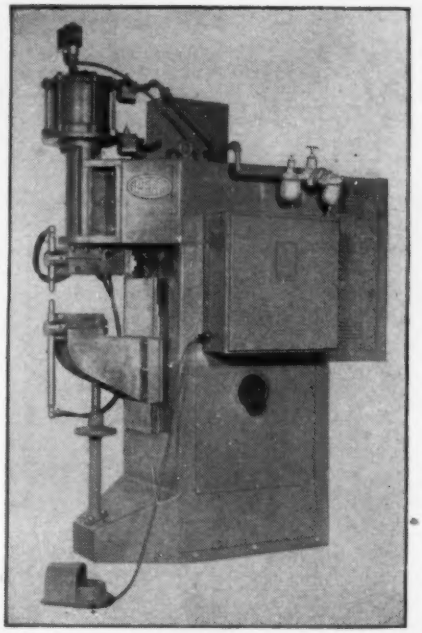
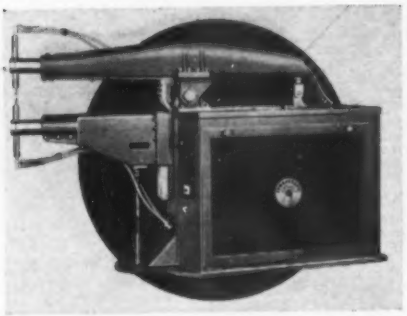


WELDING MACHINE—*Pier Equipment Mfg. Co., Benton Harbor, Mich.* High-speed precision projection and general spot resistance welding of sheet and structural steel assemblies, can be handled with this air-operated machine. Available in a number of sizes. Apr. 15, 1943, p. 130.

WELDER—*Allis-Chalmers Mfg. Co., Milwaukee, Wis.* Ampac 400 machine will handle ¼ in. electrodes, and has capacity for rods up to ⅜ in. and a range of from 50 to 500 amp. Oct. 28, 1943, p. 134.



WELDER — *Progressive Welder Co., Detroit 12, Mich.* This rocker arm welder for condenser - discharge welding of aluminum sheet handles any combination of two thickness of 24-ST Alclad. Sept. 16, 1943, p. 132.

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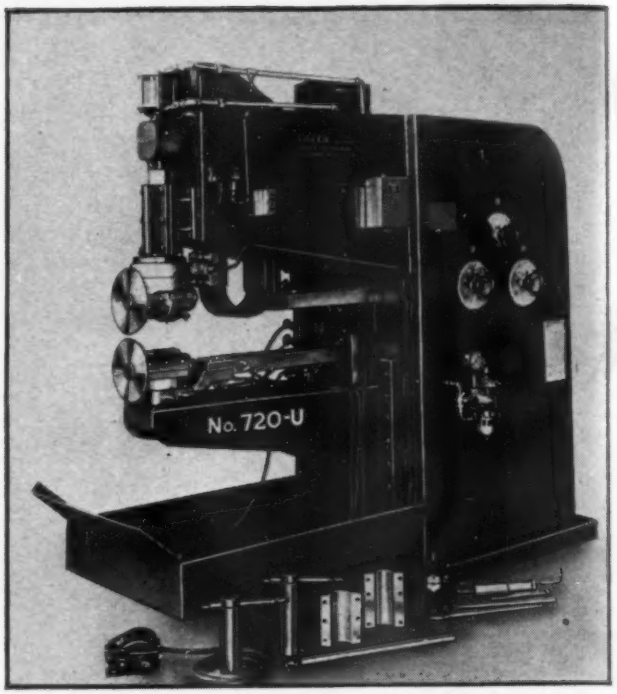

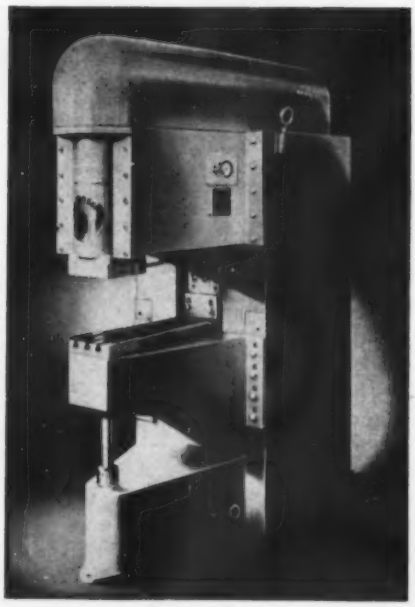

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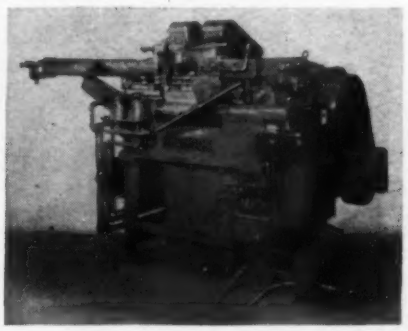
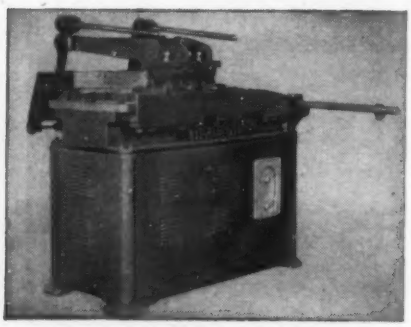
RESISTANCE WELDER—*Eisler Engineering Co., Newark 3, N. J.* Used for seam or spot-welding, this machine is air operated and of automatic press type. Nov. 11, 1943, p. 126.

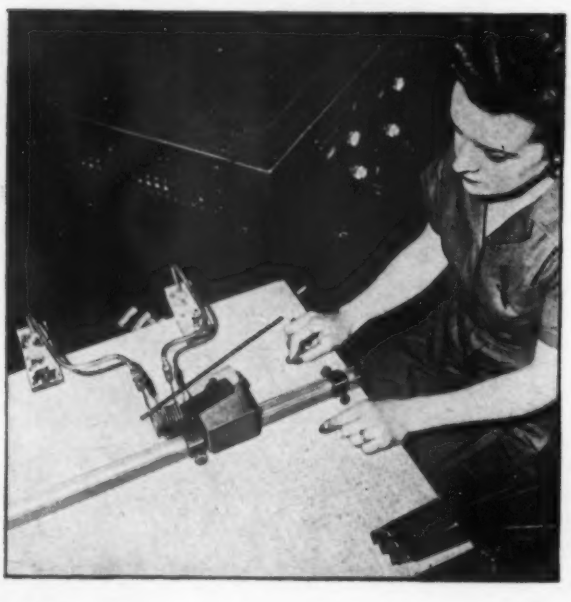
RESISTANCE WELDER — *Progressive Welder Co., 3001 E. Outer Drive, Detroit, Mich.* A line of light, medium, heavy, and extra-heavy duty models of this projection type resistance welder is available. Each size is made in 4 or 6 kva. capacities and a variety of throat depths. Apr. 1, 1943, p. 116.



FLASH WELDER — *Thompson-Gibb Electric Welding Co., Lynn, Mass.* This machine is available in eight sizes and is used principally in welding high speed steeltips to carbon steel shanks. Dec. 9, 1943, p. 122.



FLASH WELDER—*Progressive Welder Co., 3001 E. Outer Drive, Detroit, Mich.* This is the first of a series of standardized flash welders, designated as Model C rated at 150 kva. Mar. 4, 1943, p. 126.



SPOT WELDER—*Pier Equipment Mfg. Co., Benton Harbor, Mich.* Series P-20 are fully automatic and operate at speeds up to 110 strokes per min. Built in two capacities, 20 and 30 kva. Sept. 16, 1943, p. 130.

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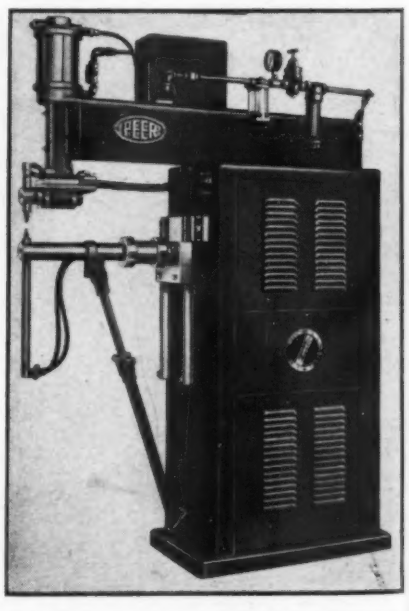
BRAZING EQUIPMENT & SERVICE—*Carboloy Co., 11149 E. Eight Mile Rd., Detroit, Mich.* The company is offering an engineering service for routine brazing of carbide tools as well as suitable equipment. June 10, 1943, p. 126.



STUD WELDER — *Nelson Specialty Welding Equipment Co., San Leandro, Calif.* Used principally in the shipbuilding industry, this improved electric arc stud welder is designed to end-weld steel stud and insulation pins ¼ to ½ in. diameter and up to 8 in. long to steel plate. Dec. 9, 1943, p. 117.

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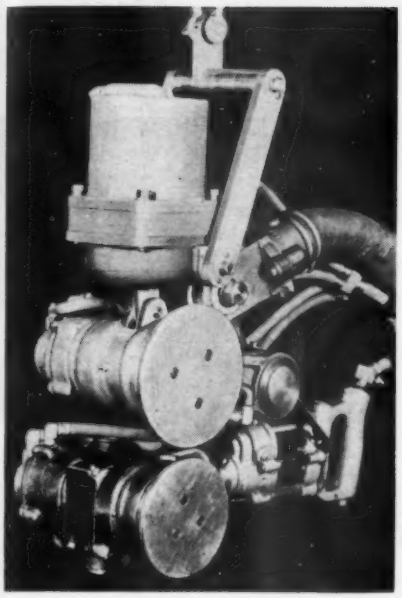
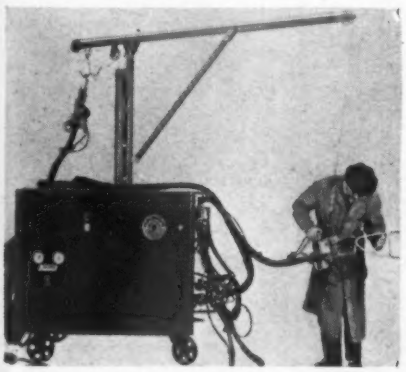


SEAM-WELDING MACHINE — *Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* Parts too large to be moved to a standard machine can be seam welded by means of this portable air-operated gun. Welds up to two thicknesses of 20 gage steel. Nov. 11, 1943, p. 130.



SPOT-WELDING CART—*Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.* This field equipment is used for spot-welding stainless and other light gage steels. Refrigeration eliminates need for external water connections. Aug. 5, 1943, p. 136.

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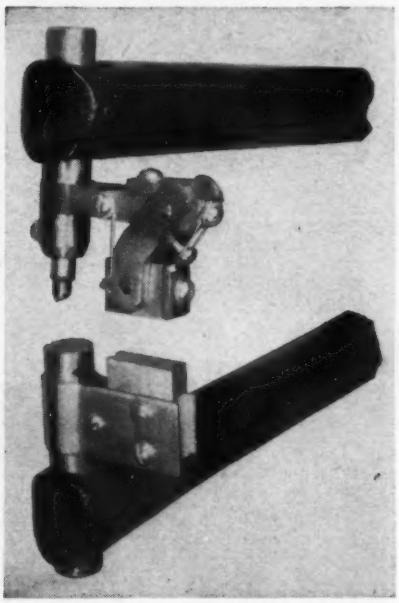
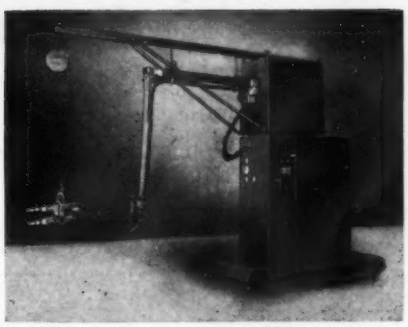
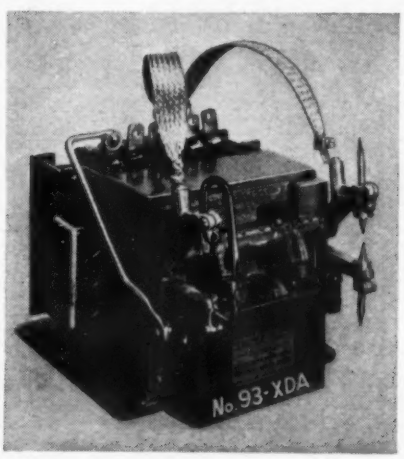
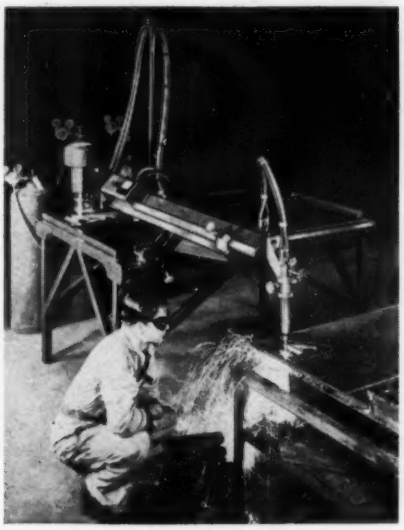
SPOT WELDER—*Eisler Engineering Co., Newark, N. J.* Light gage sheet and wire can be handled on this duplex-jaw spot-welding machine. Sept. 16, 1943, p. 128.





SPOT WELDER—*Sciaky Bros., 4915 W. 67 St., Chicago 38, Ill.* Aluminum and light alloys can be handled on this machine which employs the stored energy principle and variable pressure cycle. Dec. 9, 1943, p. 118.





FLAME-CUTTING MACHINE — *National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.* Cutting jobs up to an over-all size of 3x4 ft. can be handled with the Type JR machine. July 8, 1943, p. 136.

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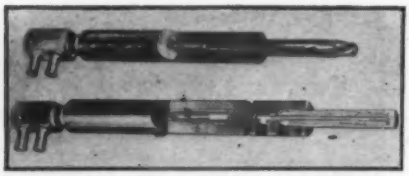
BUTT WELDER—*Commercial Platers & Manufacturers, Inc., 1827 Broadway, Rockford, Ill.* A spot-welding machine can be converted for butt and T-welding with this attachment consisting of two special electrodes. Dec. 9, 1943, p. 126.

ACETYLENE GENERATOR — *Adler Mfg. Co., 1440 N. 4 St., Milwaukee, Wis.* This is a portable unit for welding, cutting, soldering and brazing which makes use of lump carbide. Available in carbide load capacities of 12 and 25 lb. Apr. 1, 1943, p. 124.

HARD-FACING RODS—*Stoody Co., Whittier, Calif.* Stoody 1 and 6 hard-facing alloys of cobalt, chromium and tungsten are furnished as welding rods for application by acetylene process. Stoody 1 is the harder of the two alloys. Not shown. Aug. 5, 1943, p. 140.



WELDING ELECTRODE—*Frostrode Products, 19003 John R. St., Detroit, Mich.* This unit for refrigerated welding can be used on any existing welder, and features a Frostcap replaceable tip. Apr. 29, 1943, p. 117.

ELECTRODE — *Metal & Thermit Corp., 120 Broadway, New York, N. Y.* Murex Type A is an all-position a.c. electrode for electric welding. Available in four sizes. Not shown. Apr. 29, 1943, p. 134.

ELECTRODE HOLDER — *Jackson Products, Detroit, Mich.* The holder is insulated to protect eyes against flash; takes rods up to 3/16 in. May 13, 1943, p. 142.

ELECTRODE — *Harnischfeger Corp., Milwaukee, Wis.* The all-position electrode for a.c. welders is made in ⅛, 5/32, 3/16, ¼, 5/16 in. diameters, 14 and 18 in. lengths. Not shown. June 24, 1943, p. 128.

WELDING POSITIONER—*Harnischfeger Corp., Milwaukee 14, Wis.* This equipment is available with dual capacity and comes in models up to 24,000 lb. capacity. Oct. 28, 1943, p. 126.

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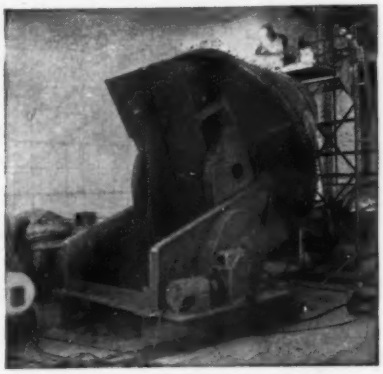
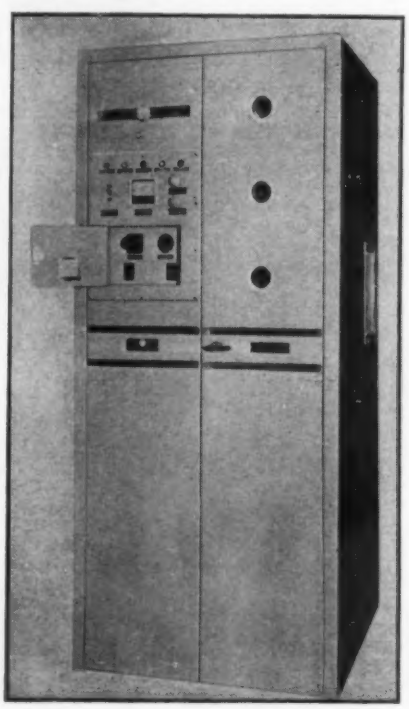
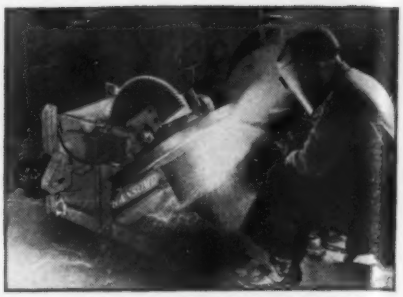
ELECTRONIC CONTROL — *General Electric Co., Schenectady, N. Y.* For resistance welding of aluminum this control provides high current and short welding time required by this metal. Mar. 18, 1943, p. 126.



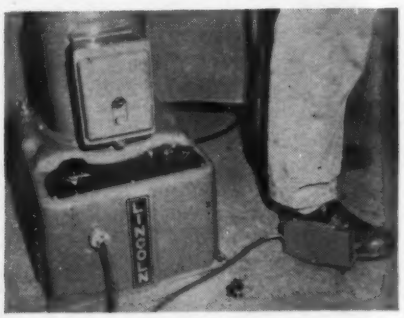
WELDING POSITIONER — *Quickwork Div., Whiting Corp., Harvey, Ill.* A range of sizes from small hand-operated units to machines with capacities of over 20 tons, is offered in a special engineering service. Dec. 23, 1943, p. 132.

WELDING POSITIONER—*Lyon-Raymond Corp., 1092 Madison St., Greene, N. Y.* This equipment has a hydraulic tilting and elevating table which revolves in any position, self-locking at any point; table dia. is 30 in. Capacity is 2000 lb. Mar. 4, 1943, p. 124.

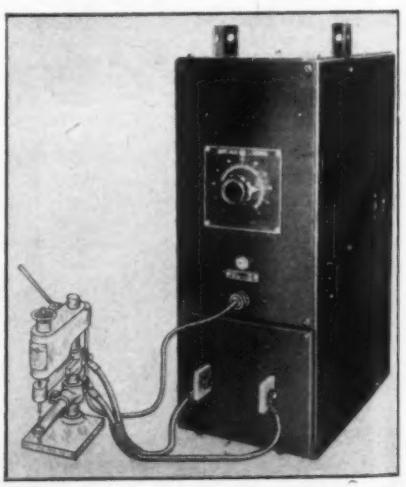




WELDING POSITIONER — *Ransome Machinery Co., Dunellen, N. J.* Capacity of this unit is 500 lb. It is available in hand or motor operated models. July 22, 1943, p. 130.

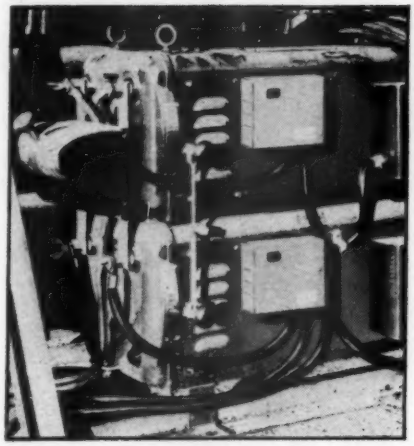


WELDING CONTROL—*Lincoln Electric Co., 12818 Coit Rd., Cleveland, Ohio.* This Lincontrol is strapped onto the welder's foot and permits freedom to move about; applicable for welding of light gage sheet metal. Extra pressure on the control increases current output. Feb. 18, 1943, p. 140.

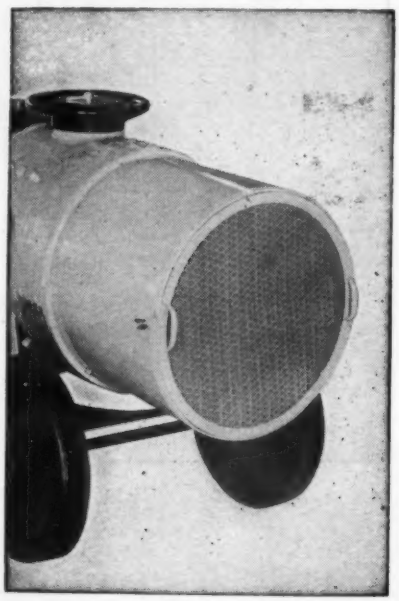


CONTROL — *General Electric Co., Schenectady, N. Y.* This synchronous control is made for precise operation of resistance welding machines; suitable for bench or wall mounting. Mar. 4, 1943, p. 130.

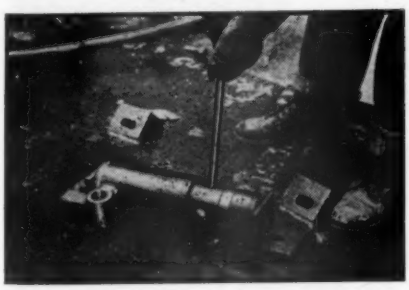
SOLENOID—*Hercules Electric & Mfg. Co., 2416 Atlantic Ave., Brooklyn, N. Y.* The arms of spot-welders can be electrically operated by use of the solenoid developed by this company. Not shown. Nov. 11, 1943, p. 136.



STARTER—*Hewlett-Packard Co., 395 Page Mill Rd., Palo Alto, Calif.* The Model 1010 automatic welding machine starter with arc-time totalizer operates in conjunction with any standard welding motor generating set. Jan. 7, 1943, p. 118.

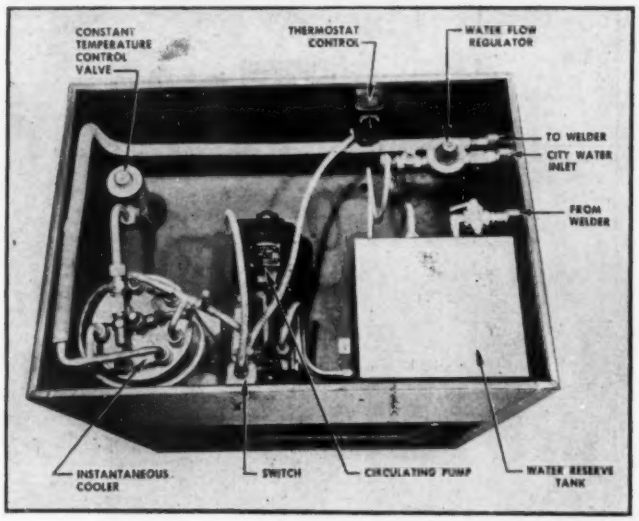


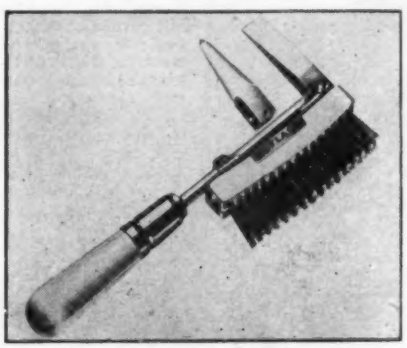
FILTER—*Badger Mfg. & Sales Co., 327 E. Brown St., Milwaukee, Wis.* Downtime caused by frozen or clogged rotors is eliminated by this permanent filter for d.c. generator welding units. Dec. 23, 1943, p. 130.



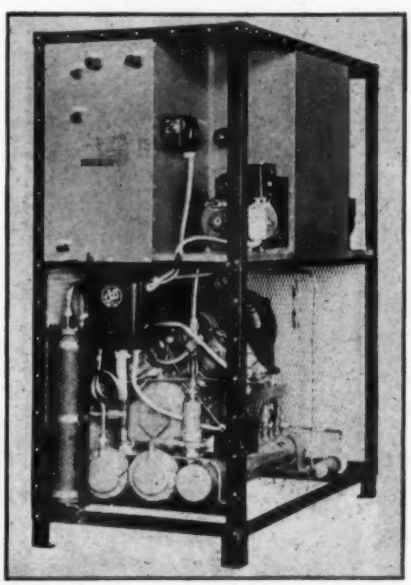
JACK—*Templeton, Kenly Co., 1020 S. Central, Chicago, Ill.* Simplex-Astin shiplifters jack is suited for setting heavy deck plates for butt or lap weld joints. Aug. 5, 1943, p. 138.

COOLER—*Temprite Products Corp., 47 Piquette Ave., Detroit, Mich.* The Model 530-WC spotwelder cooler operates as a water-circulating system to supply low temperature water to welder tips and transformers; can be used to operate one, two or three separate spotwelders. Feb. 18, 1943, p. 150.

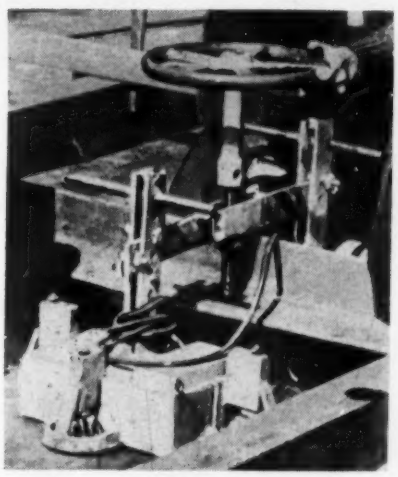




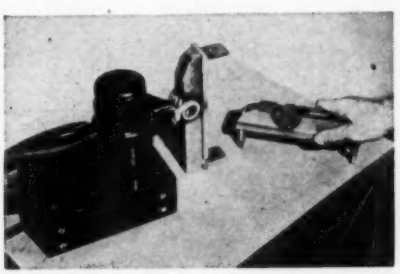
CLEANING TOOL—*Atlas Welding Accessories Co., 307 Boulevard Bldg., Detroit, Mich.* A wire bristle brush and slap-removing bit are combined in one unit in this Dual-Tool weld cleaning device. March 18, 1943, p. 140.



WELDING TIP COOLER—*Fairbanks-Morse & Co., 600 S. Michigan Ave., Chicago, Ill.* This is a self-contained unit which circulates a special non-corrosive, non-precipitating solution through welding tips of a spotwelder. Has a cooling capacity of 8,400 B.t.u. per hr. Feb. 18, 1943, p. 137.

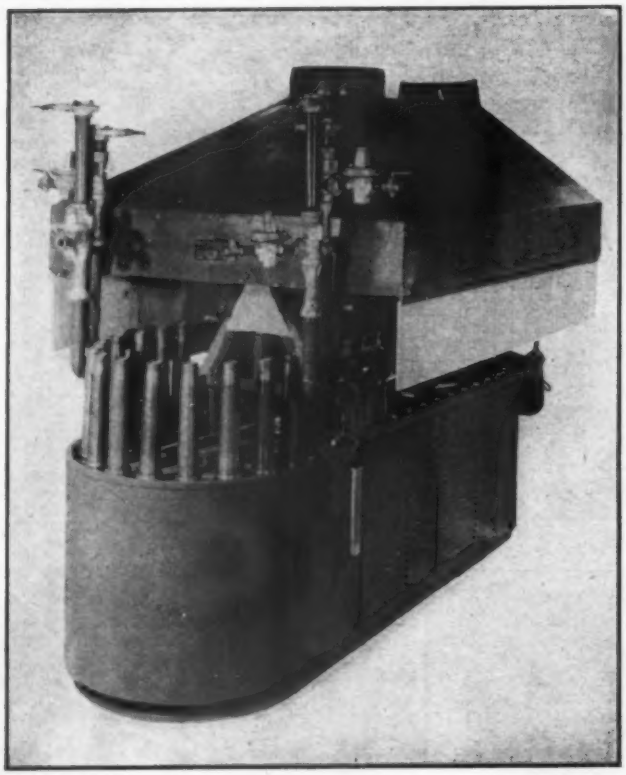


MAGNETIC CLAMP—*Glenn-Roberts Co., 1009 Fruitvale Ave., Oakland, Calif.* Although developed for shipyard use, the Sweetland clamp for positioning welded parts is adaptable to wide variety of uses. Aug. 19, 1943, p. 134.



INDUCTOR COIL—*Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J.* This focus coil concentrates heat in small areas on both walls of metal parts for hardening by induction heat. Nov. 25, 1943, p. 126.

SWITCH—*Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.* For resistance welding and other applications, this electro-thermostatic flow switch detects any lack of water which is required for cooling Ignitron tubes. Not shown. June 24, 1943, p. 136.



HEAT - TREATING MACHINE—*Selas Co., Erie Ave. and D St., Philadelphia, Pa.* Continuous annealing of mouth ends of steel cartridge cases from 37 to 105 mm. can be performed in this automatic machine. Mar. 18, 1943, p. 125.

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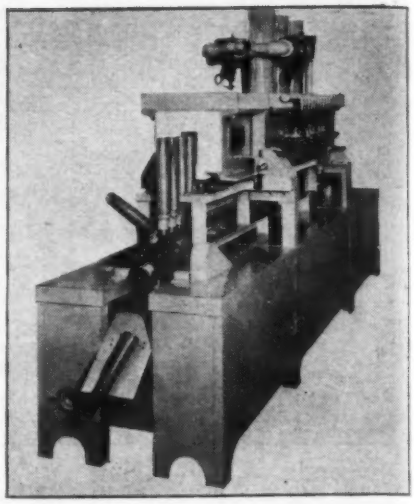

ANNEALING MACHINE—*Morrison Engineering Co., Cleveland, Ohio.* 37 and 40 mm. steel cartridge cases, 57, 75 and 105 mm. cases, and 90 mm. as well as 3 in. anti-aircraft cases can be annealed in this flame-type mouth and body machine. June 24, 1943, p. 130.

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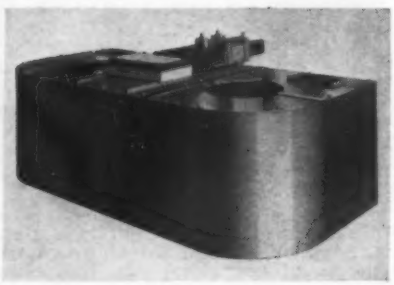
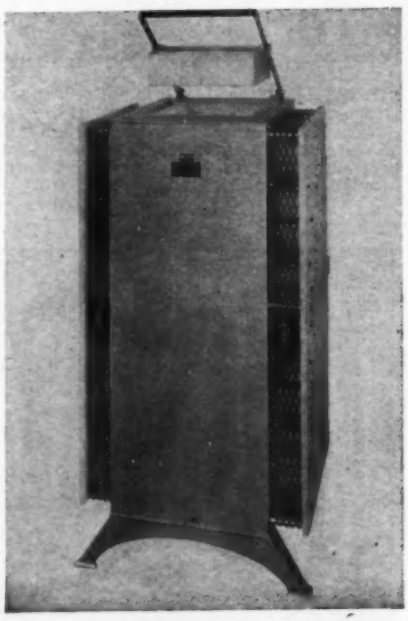
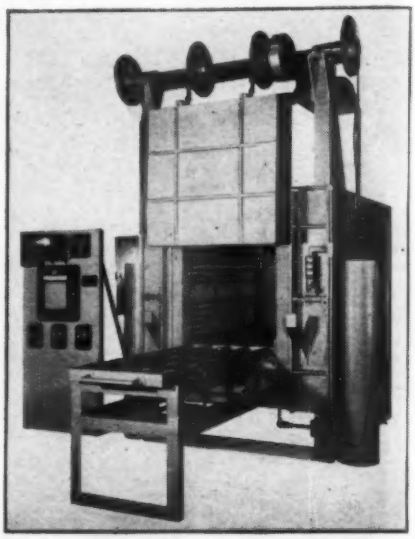


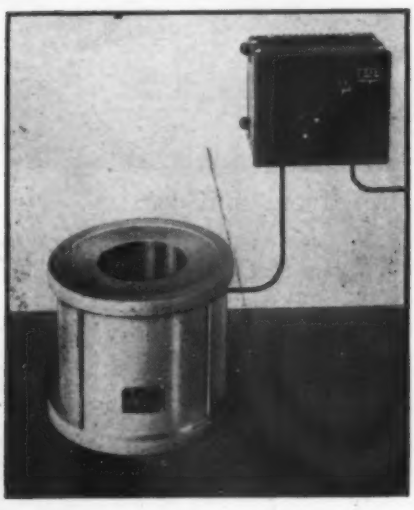
HEAT-TREATING UNIT—*A. F. Holden Co., New Haven, Conn.* Preheating, hardening and quenching of high-speed tools can be performed with the Type 230 unit which provides three baths for tools. Sept. 16, 1943, p. 132.



HARDENING FURNACE—*Sentry Co., Foxboro, Mass.* The Size 4B Model YP vertical high-speed steel hardening furnace will attain temperature of 2,500 F. and handles tools up to 4¾ in. diameter, 36 in. long. May 27, 1943, p. 140.



HEAT-TREATING FURNACE—*H. O. Swoboda, Inc., Thirteenth St., New Brighton, Pa.* This box-type furnace, available in chamber dimensions up to 30 in. square by 4 ft., 6 in. deep, is suited for general heat-treating temperatures up to 2,000 F. May 27, 1943, p. 142.



CARBURIZING FURNACE — *Lee Grinder Co., 4708 Armitage Ave., Chicago, Ill.* The Cub bench type unit for toolroom use operates intermittently or continuously on 110-130 volt circuit at a maximum temperature of 1600 F. Aug. 5, 1943, p. 136.

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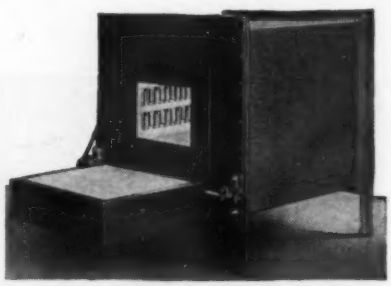
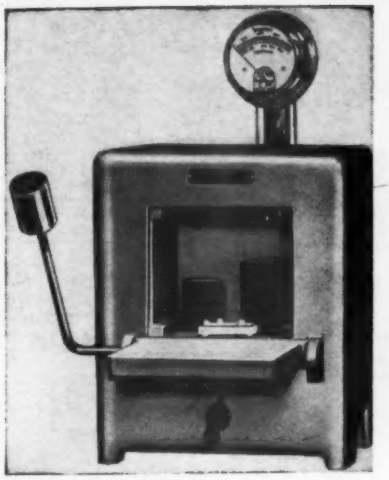
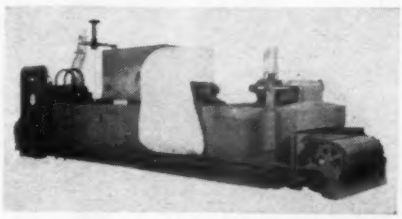


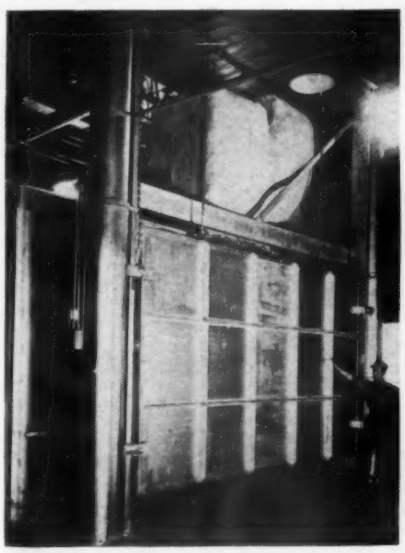
TOOLROOM FURNACE — *Harold E. Trent Co., Leverington Ave. and Wilde St., Manayunk, Philadelphia, Pa.* The MLR-4 bench type furnace for hardening, annealing and heat-treating is intended for bench use. Runs continuously at 1,850 F. and operates on 115 volts. June 24, 1943, p. 134.



HEAT-TREATING FURNACE—*Thermo Electric Mfg. Co., 480 W. Locust St., Dubuque, Ia.* Three heat selections are available for heat-treating small metal parts in this Temco electric furnace which operates continuously up to 1,500 F. and intermittently to 1,850 F. May 13, 1943, p. 140.



DRAW FURNACE—*Industrial Oven Engineering Co., 11621 Detroit Ave., Cleveland, Ohio.* Various sizes and capacities and temperatures ranges up to 900 F. are available in this furnace for stress relieving of armor piercing shot. Dec. 9, 1943, p. 126.



FURNACE—*Despatch Oven Co., Minneapolis, Minn.* This is a car-bottom type stress relief furnace for removing stresses in weldment of a variety of types. Mar. 4, 1943, p. 124.

HARDENING FURNACE—*Sentry Co., Foxboro, Mass.* Improvements in this Model Y high-speed steel furnace include an asbestos loading shelf, added strength and greater safety factor. Apr. 1, 1943, p. 122.
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INDUCTION HEATER—*Ohio Crankshaft Co., Cleveland 1, Ohio.* Tocco Junior, 15 kw. induction heating machine can be adapted to brazing, annealing, heat-treating, heating for forging and surface hardening of small and medium sized parts. Sept. 2, 1943, p. 134.

HEATER—*General Electric Co., Industrial Heating Div., Schenectady, N. Y.* This electronic heater, available in two sizes, is suited for high-frequency induction heating of metal parts for brazing, soldering, selective heat-treating. July 8, 1943, p. 140.
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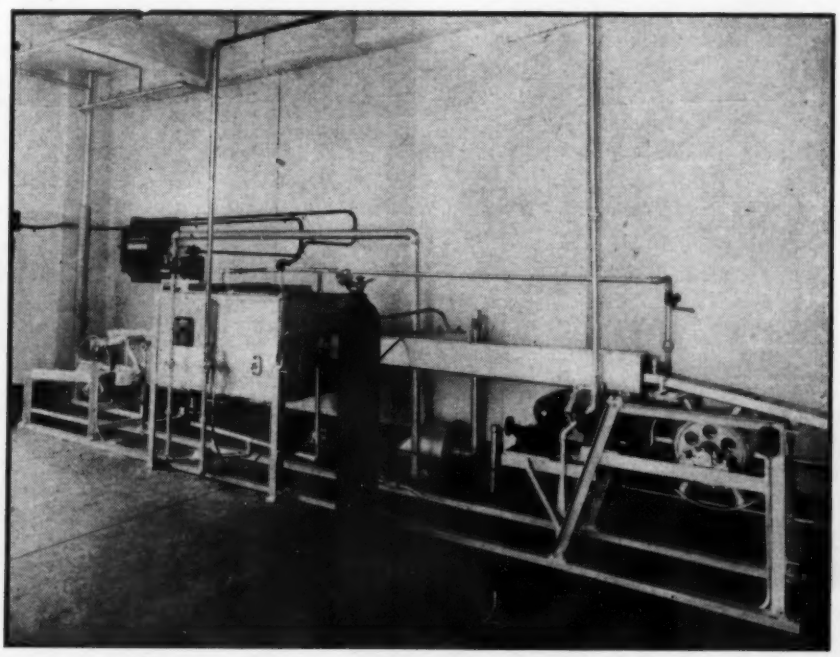
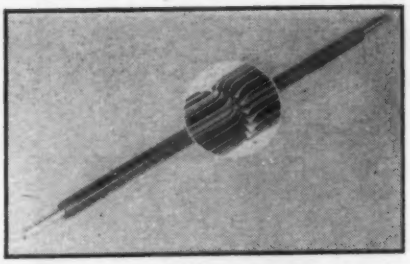


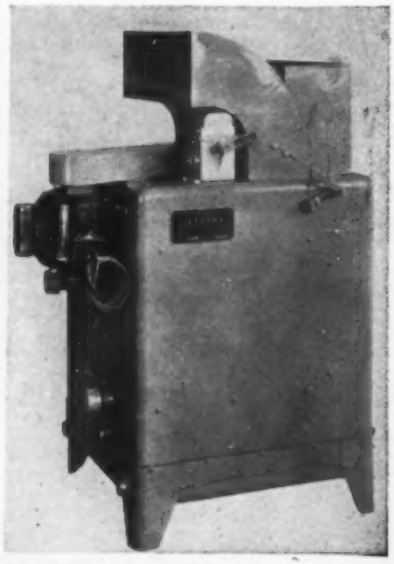
BRAZING FURNACE—*W. S. Rockwell Co., 50 Church St., New York 7, N. Y.* This small furnace is designed for continuous, automatic brazing of copper, silver soldering, sintering or bright annealing of formed objects by gas or electricity. Oct. 14, 1943, p. 146.

INDUCTION HEATING MACHINE—*Van Norman Machine Tool Co., Springfield, Mass.* This unit is suited for surface hardening, brazing, soldering and other heating applications requiring localized heat. Available in 16 and 32 kw. sizes. Apr. 1, 1943, p. 120.

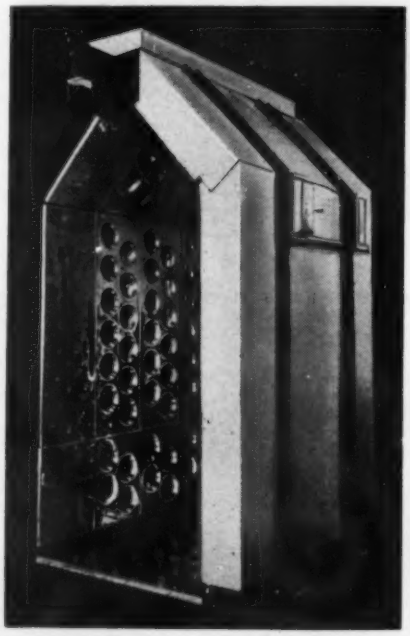
HEAT EXCHANGER—*Niagara Blower Co., 6 E. 45 St., New York 17, N. Y.* The Aero unit now includes a heat adding unit and is suited to control temperatures of quenching baths for heat-treating metals, of cutting oils and lubricants in metal-working and wire drawing. Sept. 30, 1943, p. 128.



FINTUBE—*Brown Fintube Co., 160 Filbert St., Elyria, Ohio.* This Brown longitudinal fintube is cut and twisted transversely to provide increased heat transfer in heat exchanges. Sept. 2, 1943, p. 140.



COOLER—*Niagara Blower Co., 6 E. 45 St., New York 17, N. Y.* This aero equipment serves as an after cooler for cooling compressed air. Nov. 25, 1943, p. 134.

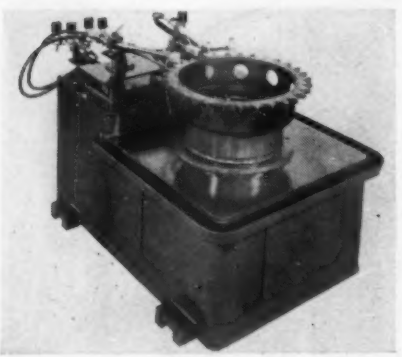


INFRA-RED OVEN — *Infra-Red Engineers & Designers, 1632 E. 40 St., Cleveland, Ohio.* Panels in standardized sections are available in 10 sizes in length from 17 in. for three lamps to 51 in. for 12 lamps. Panels are wired ready for service and can be mounted alone or together in many positions. June 10, 1943, p. 125.

HEAT EXCHANGE—*Niagara Blower Co., 6 E. 45 St., New York, N. Y.* A method of automatic air temperature control has been developed for this unit, used for cooling industrial liquids. Apr. 15, 1943, p. 130.

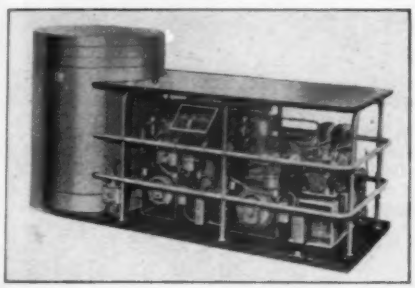
PAINT BAKING OVEN—*Gehnrich Corp., 34-10 Skillman Ave., Long Island City, N. Y.* This is a conveyor type oven which is suited for aluminum parts of airplane engines of different sizes and weights. Sept. 30, 1943, p. 116.

CHILLING UNIT—*Motor Products Corp., Deepfreeze Div., 2301 Davis St., N. Chicago, Ill.* A range of —70 F. is provided in the Model D-70 Deepfreeze 2-stage industrial chilling unit for testing aircraft instruments and parts, plastics and other material. Cylinder interior is 18 in. diameter and 30 in. deep. Apr. 29, 1943, p. 130.



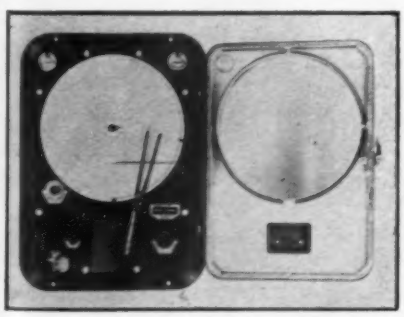
FLAME HARDENER—*Hydraulic Machinery Co., 12825 Ford Rd., Detroit, Mich.* No. 501 Hy-Mac machine handles small parts; the No. 502 is an automatic machine built for hardening sprockets. Sept. 2, 1943, p. 132.

HUMIDITY CONTROL—*American Coil Co., 25-27 Lexington St., Newark, N. J.* The Amcoil low and high temperature test chamber is made with automatic humidity control. Temperature range provided is from —67 to +160 F. Usable space is more than 25 cu. ft. June 24, 1943, p. 130.



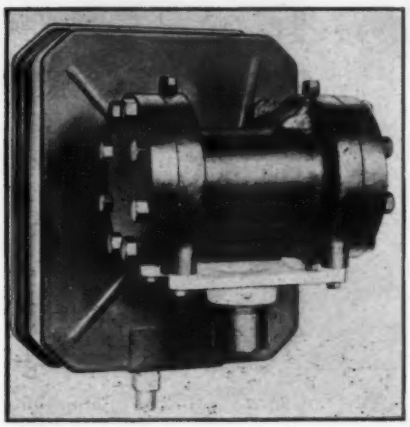
CHILLING MACHINE—*Motor Products Corp., Deepfreeze Div., 2301 Davis St., N. Chicago, Ill.* The improved Deepfreeze Cascade unit, for application in shrinking, treating and testing of metals, provides temperature control device for range from atmosphere to —120 F. It has capacity to remove 1,000 B.t.u. per hour. June 10, 1943, p. 130.

THERMOMETER — *C. J. Tagliabue Mfg. Co., Park & Nostrand Aves., Brooklyn, N. Y.* A feature of this instrument is the plastic case front which is said to be unaffected by temperatures. Not shown. Oct. 14, 1943, p. 154.

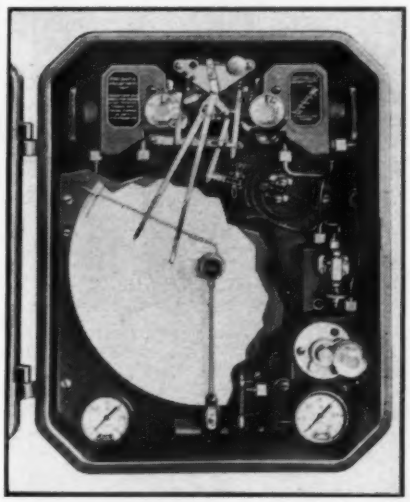


CONTROLLER—*Bristol Co., Waterbury, Conn.* This air-operated automatic control device is suited for temperatures up to 3,600 F., flow, liquid level, pressure, pH value, draft humidity and time program. May 13, 1943, p. 146.

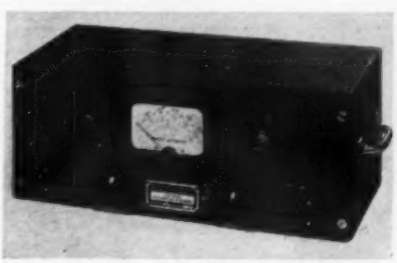
FURNACE CONTROL — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* The Regulex exciter has been applied to this electric arc furnace control designed to maintain arc energy to constant quantity without use of contact making device. Not shown. Feb. 18, 1943, p. 142.



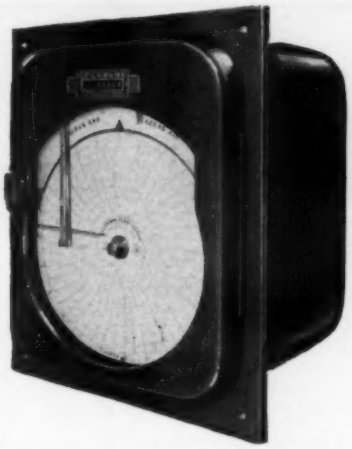
MANOMETER — *Taylor Instrument Companies, Rochester, N. Y.* This company has introduced an aneroid manometer, which excludes use of mercury or other liquids for all types of recording and indicating meters and controllers. Feb. 18, 1943, p. 148.



CONTROLLER — *Taylor Instrument Companies, Rochester, N. Y.* This is essentially a Fulscope unit to convert changes in input air pressure into linear movements of the set pointer. Sept. 30, 1943, p. 124.

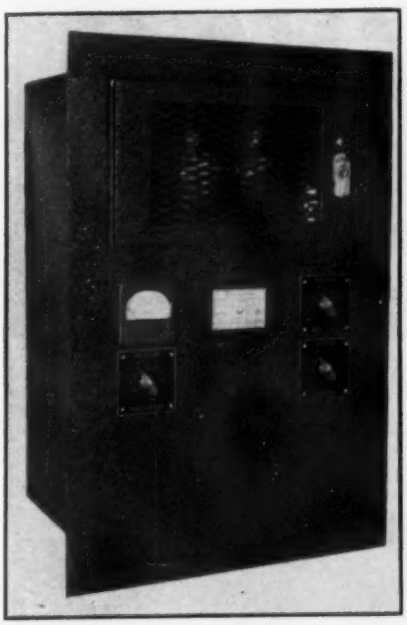


TEMPERATURE INDICATOR — *North American Phillips Co., Industrial Electronics Div., Pershing Sq. Bldg., New York, N. Y.* Three temperature ranges are provided in this Norelco electronic instrument. Dec. 9, 1943, p. 122.



ELECTRIC FLOW METER—*Cochrane Corp., 17 St., and Allegheny Ave., Philadelphia, Pa.* This 2-pen unit indicates measurement of controlled atmospheres and flow of oil to quenching tanks. May 13, 1943, p. 144.

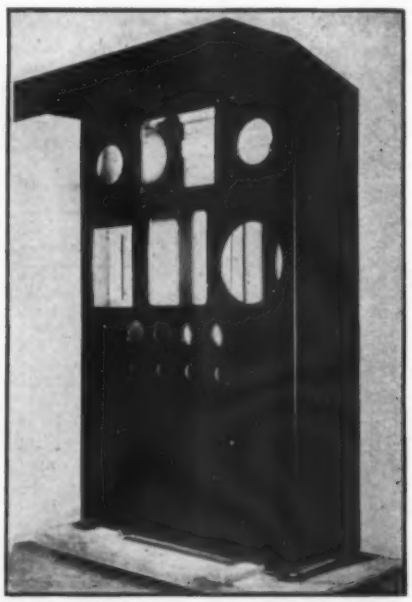
TEMPERATURE CONTROL—*Wheelco Instruments Co., Harrison and Peoria Sts., Chicago, Ill.* This is an automatic temperature, cycle or program control for pot type furnaces, processing kettles or salt bath heat-treatment applications. Not shown. No. 3. Feb. 4, 1943, p. 126.



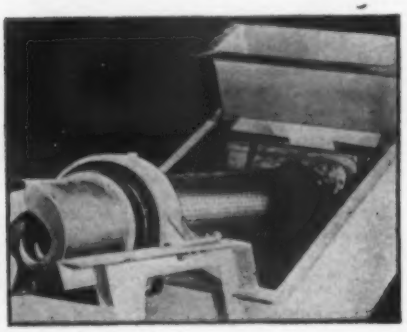
CONTROLLER—*Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.* The Furnatron control system is designed to keep resistance-furnace temperature variations to a minimum. Sept. 30, 1943, p. 126.

TRANSMITTER—*Cochrane Corp., 17 St. and Allegheny Ave., Philadelphia, Pa.* The Style H transmitter is designed for measurement of low static pressure gases, and is used in conjunction with standard Cochrane electric meter receiving units. Not shown. Feb. 18, 1943, p. 144.

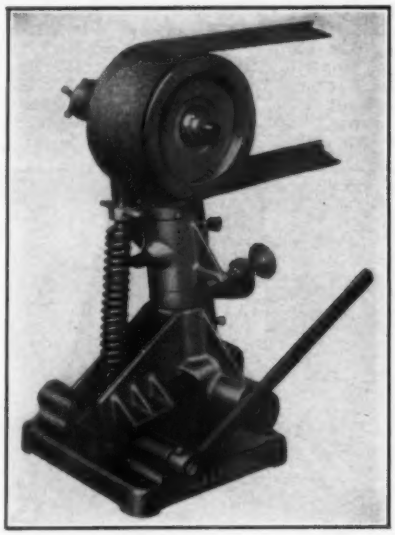
TIMER—*R. W. Cramer Co., Centerbrook, Conn.* This device automatically controls percentage of time at which alternating current circuit can be be closed or opened. Seven time ranges are available. May 13, 1943, p. 148.



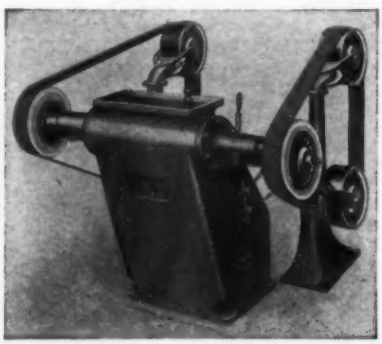
CONTROL PANEL—*Hays Corp., Michigan City, Ind.* Masonite replaces steel in the instrument and control panels made by this company. Jan. 7, 1943, p. 124.



SPIRALVEYOR—*Salem Engineering Co., Salem, Ohio.* This unit is used for removing quantities of heat-treated parts from the quench to a pickling unit at the rate of 8,000 lb. per hr. Apr. 15, 1943, p. 140.

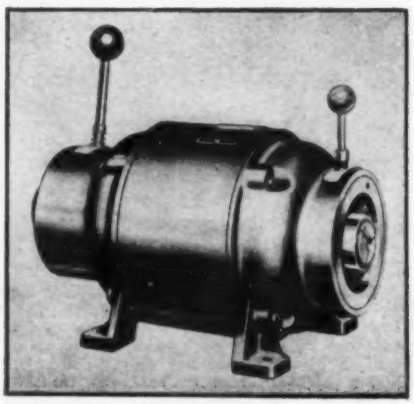


BELT IDLER — *Mattison Machine Wks., Rockford, Ill.* The No. J-135 abrasive belt idler stand and pulley will convert regular grinding and polishing lathe to use of coated abrasive belts. Apr. 15, 1943, p. 134.

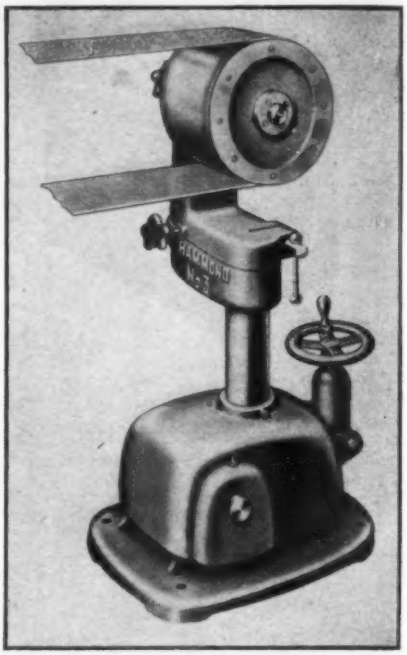


BELT IDLER—*Jones Engineering Co., Ellwood City, Pa.* This abrasive belt backstand idler is a floor-type model for grinding or polishing lathe. May 13, 1943, p. 148.

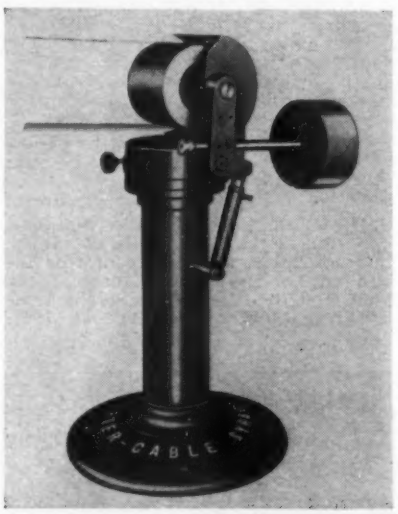
VIBRA-FLOW CONVEYOR—*Syntron Co., Homer City, Pa.* A feeder conveyor with rheostat control has been developed by this company for feeding metal parts to continuous heat-treating furnaces. Not shown. Mar. 18, 1943, p. 128.



BUFFS—*Hanson-Van Winkle-Munning Co., Matawan, N. J.* Small diameter buffs from 1 in. up used as headed-up wheels for polishing in places difficult to get at are available in 30-ply sections. Not shown. May 13, 1943, p. 150.



BACKSTAND IDLER—*Hammond Machinery Builders, Inc., 1618 Douglas Ave., Kalamazoo, Mich.* This No. 3 abrasive belt idler features a spring-loaded adjusting screw and handwheel to maintain uniform tension on the belts. Jan. 7, 1943, p. 122.



BACKSTAND IDLER — *Porter-Cable Machine Co., Syracuse 8, N. Y.* Grinding and polishing lathes can be adapted to abrasive belt grinding with this unit. Dec. 9, 1943, p. 126.

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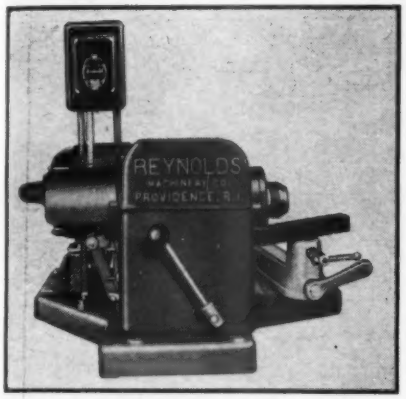
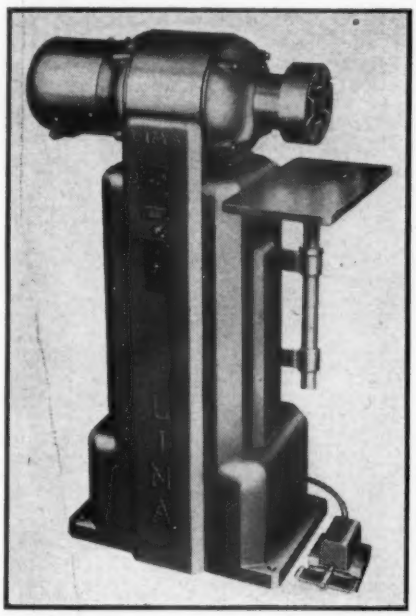
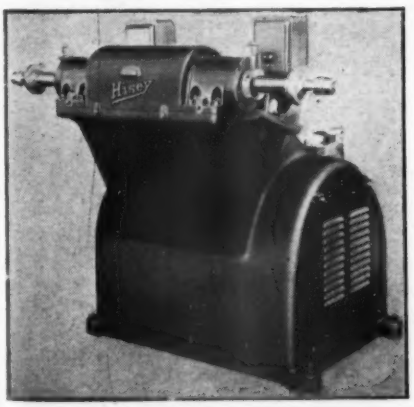
POLISHING LATHE — *Crozier Machine Tool Co., Hawthorne, Calif.* A clearance hole through the entire machine permits polishing portion of a long piece of work up to maximum capacity. Offered in 14 models of varying capacity. Apr. 29, 1943, p. 117.



POLISHING LATHE — *Reynolds Machinery Co., Providence, R. I.* Any standard motor can be used on this collet-head unit for polishing, finishing, filing and burring operations. It uses a No. 5c Rivett collet. Sept. 30, 1943, p. 126.

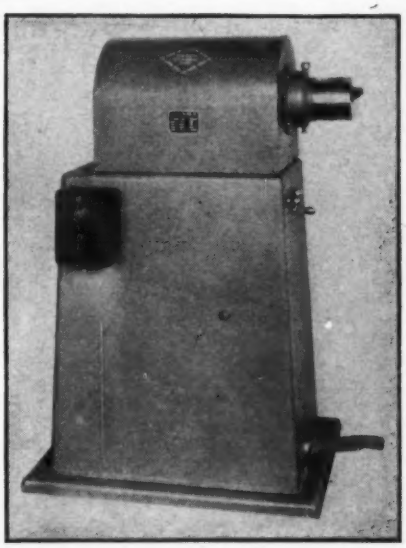


LATHE—*Lima Electric Motor Co., 1501 Findlay Rd., Lima, Ohio.* Steel and other ferrous metal shapes can be held on this magnetic polishing lathe, suited for polishing, burring or lapping operations. Sept. 30, 1943, p. 113.



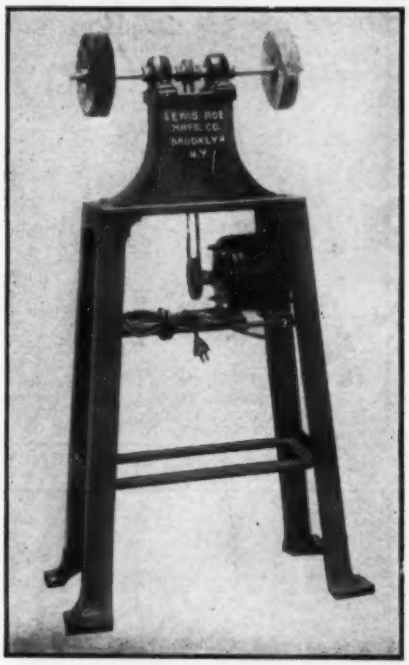
POLISHING MACHINE — *Lewis Roe Mfg. Co., 1042-1050 DeKalb Ave., Brooklyn, N. Y.* This machine is suited for light buffing and coloring work. Nov. 11, 1943, p. 136. →

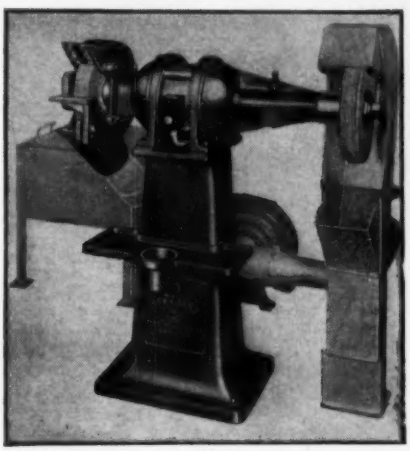
SPEED LATHE—*Standard Electrical Tool Co., 2488 River Rd., Cincinnati, Ohio.* Two operations can be performed at one time on this speed lathe fitted with Sjogren collet chuck and 4-in. universal lathe chuck. Oct. 28, 1943, p. 122.



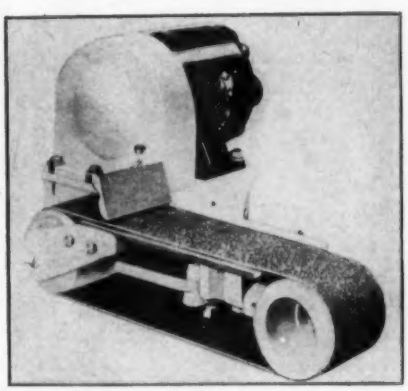
POLISHING LATHE — *Schauer Machine Co., 2063 Reading Road., Cincinnati, Ohio.* The Ideal variable speed lathe finishes metal or plastic parts. June 10, 1943, p. 140.

POLISHER & BUFFER — *Hisey-Wolf Machine Co., Cincinnati, Ohio.* This machine is built in the single spindle, single motor type as well as two spindle, two motor style, having capacities from 3 to 10 hp. Jan. 7, 1943, p. 113.

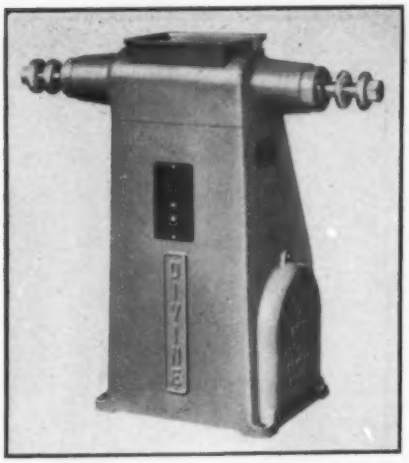




GRINDING AND BUFFING MACHINE—*Standard Electrical Tool Co., 2488 River Rd., Cincinnati, Ohio.* This combination machine is a variable in 1, 3, and 5 hp. sizes. Jan. 7, 1943, p. 113.



GRINDER—*Walls Sales Corp., 96 Warren St., New York, N. Y.* The Duplex M-6 abrasive band and disk combination grinder does grinding and finishing. Apr. 29, 1943, p. 120.



POLISHING LATHE — *Divine Bros. Co., Utica, N. Y.* The VJ light-duty lathe for small parts polishing and burring is available with motor sizes up to 3 hp. Aug. 19, 1943, p. 142.

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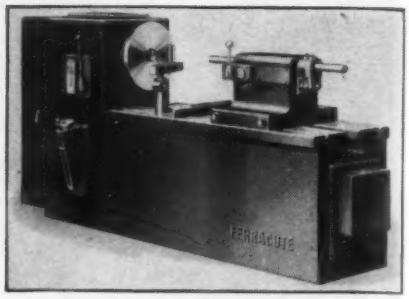
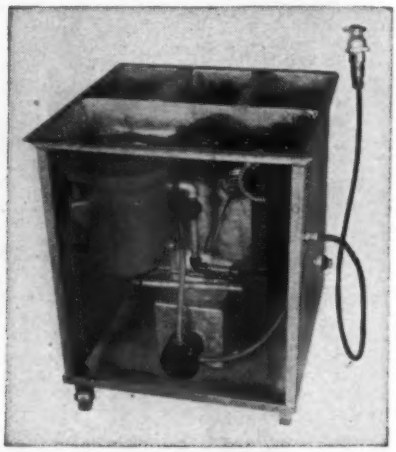


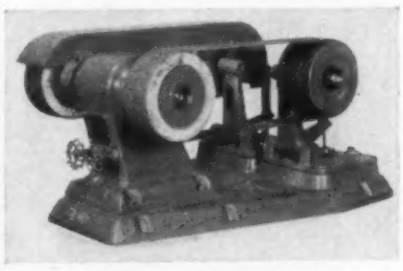
SPINNING LATHE — *Ferracute Machine Co., Bridgeton, N. J.* An air-operated tailstock spindle is a feature of this machine for spinning, buffing, burnishing, trimming, wiring and beading. Maximum swing is 24 in. and distance between centers 48 in. July 22, 1943, p. 130.

BELT GRINDER — *Hammond Machinery Builders, Inc., 1618 Douglas Ave., Kalamazoo, Mich.* The 6 in. machine is suited for wet and dry operations. July 8, 1943, p. 140.

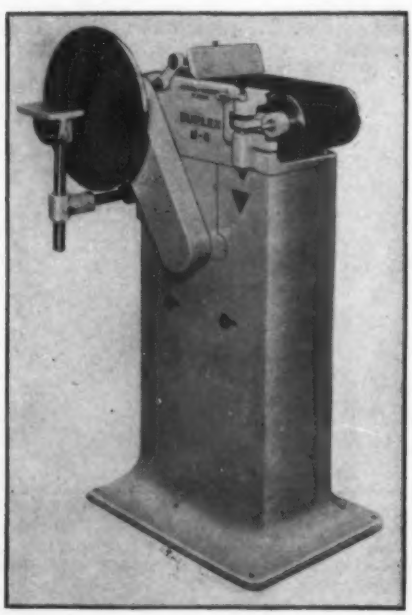
SANDER—*Boice-Crane Co., 935 Central Ave., Toledo, Ohio.* Aluminum and iron can be ground on this oscillating spindle sander available in sizes ¾ to 3 in. Sept. 2, 1943, p. 130.



DEGREASING UNIT — *Phillips Mfg. Co., 3475 W. Touhy Ave., Chicago, Ill.* This is a combination washing, drying and rustproofing device for instruments and other small parts. Dec. 23, 1943, p. 130.



CLEANING TANK — *Aeroil Burner Co., West New York, N. J.* The Twin Dipmaster cleans and rinses metal parts in two individually controlled tanks, which eliminate carrying parts from one operation to the other. Not shown. Dec. 23, 1943, p. 122.



GRINDER AND POLISHER — *Jones Engineering Co., Ellwood City, Pa.* This bench-type grinder and polishing machine is adaptable to any type of grinding and finishing of flat pieces and irregular shaped parts. Aug. 19, 1943, p. 138.

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GRINDING MACHINE—*Packer Machine Co., Meriden, Conn.* Packer-Matic No. 7 continuous rotary grinder will deburr various special shapes. Sept. 2, 1943, p. 128.

ABRASIVE GRINDER—*Wales Sales Corp., 96 Warren St., New York, N. Y.* This is a bench type abrasive band grinder, powered by a 1/3 hp. motor. Apr. 15, 1943, p. 134.

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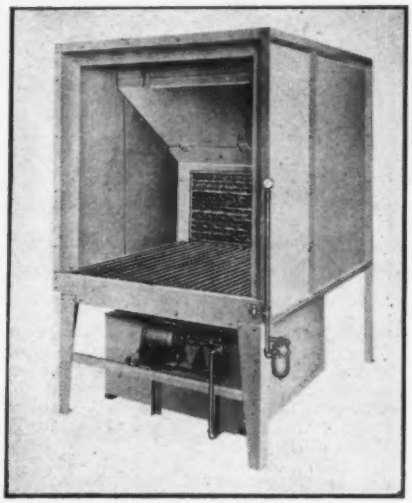
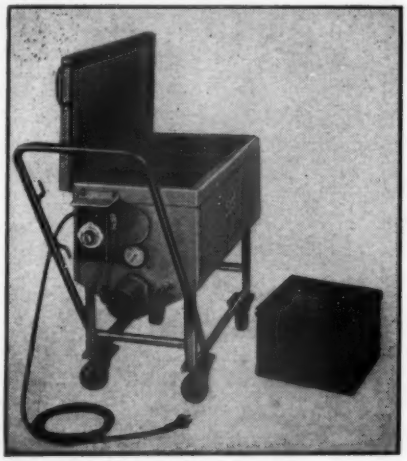
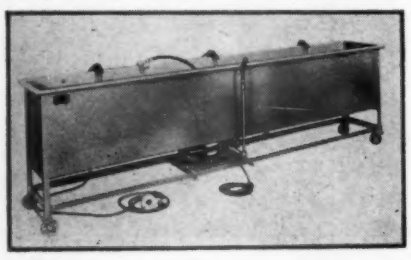
DEGREASING BOOTH — *DeVilbiss Co., Toledo, Ohio.* This unit can be furnished in sizes varying according to requirements of products to be handled; delivers hard-driving solvent spray. Sept. 16, 1943, p. 138.

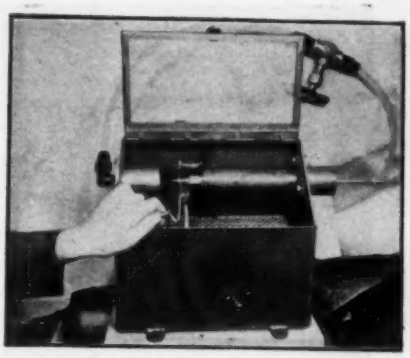




TANK—*Aeroil Burner Co., West New York, N. J.* Waxmaster, Jr., hot-wax tank is suited for dipping parts in wax to protect them from moisture and salt air. The unit operates on 110 or 220 volts a.c. or d.c. and has a 12-gal. tank. Sept. 30, 1943, p. 116.

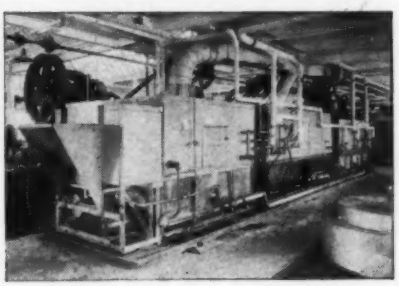
METAL WASHER—*American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind.* The Tabl-Spray cleans flat and circular metal parts of 25 in. diameter and 12 in. high. Aug. 5, 1943, p. 126.





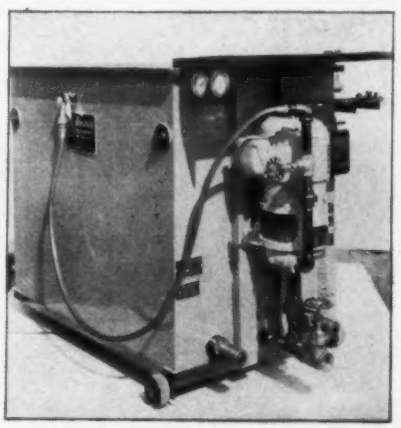
BEARING WASHER — *American Foundry Equipment Co., Metal Washing Div., Mishawaka, Ind.* Manual handling is eliminated in cleaning and oiling bearings from ¼ to 1¼ in. outside diameter by use of this washer. July 8, 1943, p. 133.

GREASE DIP TANK—*Circo Products Co., 2835 Chester Ave., Cleveland, Ohio.* This machine is suited for rustproofing guns and parts and has a heat range from 60 to 250 F. Inside dimensions are 102 in. long, 10 in. wide and 12 in. deep. July 8, 1943, p. 146.



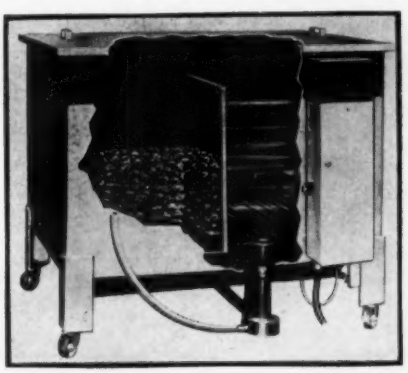
PICKLING MACHINE—*Howard Engineering & Mfg. Co., 1812 Freeman Ave., Cincinnati, Ohio.* A maximum of 8,000 37 mm. shell cases per hr. can be cleaned in this machine which operates without use of pumps. June 10, 1943, p. 132.

CANNON CLEANERS—*Circo Products Co., 2835 Chester Ave., Cleveland, Ohio.* 37 mm. and 57 mm. cannon can be accommodated in the two sizes of this cleaner. The available models have capacities of 20 and 25 gal. July 8, 1943, p. 142.



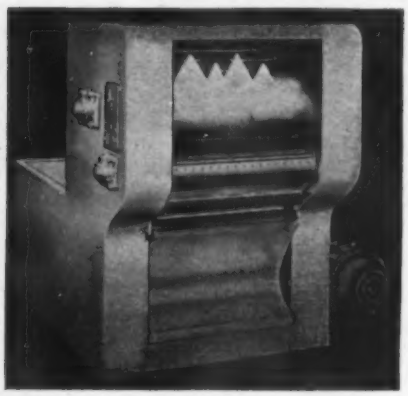
PARTS WASHER—*Magnus Chemical Co., Garwood, N. J.* This is a portable machine for cleaning large and small metal parts, handling them by three methods. Three sizes are available. May 13, 1943, p. 136.

DIPPING TANK—*Aeroil Burner Co., Park Ave. at 57 St., West New York, N. J.* The Dipmaster, Jr., is a portable insulated electrically heated tank for cleaning and degreasing metal parts. Two dipping baskets 11¾ in. square by 8 in. deep are provided. Not shown. Apr. 15, 1943, p. 134.

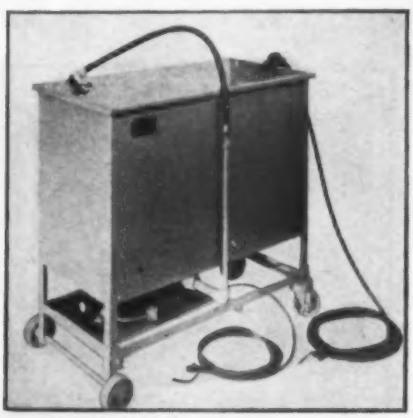


DEGREASER—*Phillips Mfg. Co., 3467 Touhy Ave., Chicago, Ill.* This is a portable double-dip machine for degreasing small parts. One tank subjects the parts to solvent cleaning and the other is for vapors. June 10, 1943, p. 136.

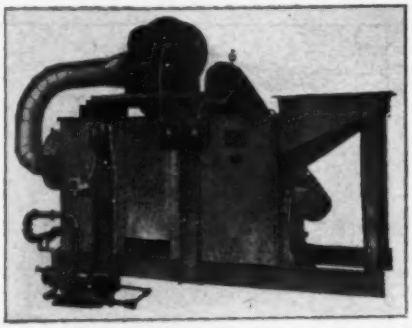
CLEANING MACHINE — *W. W. Sly Mfg. Co., 4735 Train Ave., Cleveland, Ohio.* Six 30-in. diameter tables are provided in this centrifugal type, blast cleaning machine. July 22, 1943, p. 142.



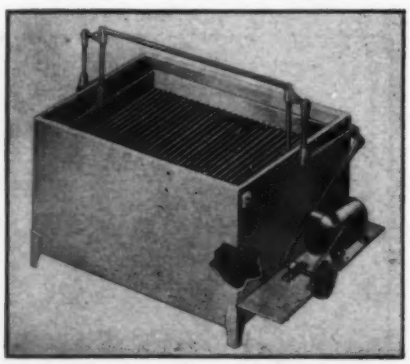
WASHING MACHINE — *American Foundry Equipment Co., Mishawaka, Ind.* The Tumbl-Spray is a small parts washer available for heating with gas, electricity or steam. Mar. 18, 1943, p. 128.



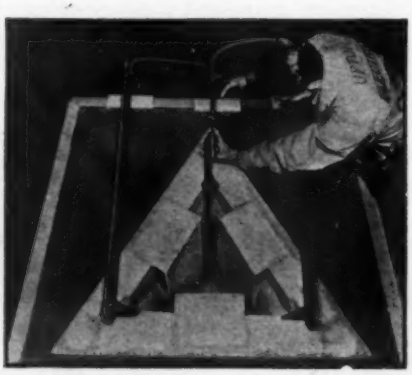
METAL PARTS CLEANER — *Circo Products Co., 2835 Chester Ave., Cleveland, Ohio.* This portable unit takes any type of metal part; inside dimensions are 36 in. long by 20 in. deep. Feb. 4, 1943, p. 116.



CLEANING MACHINE—*Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.* Model 270 Autosan revolving type unit automatically feeds, dries and discharges parts continuously. Capacity from 20 to 45 cu. ft. per hr. May 13, 1943, p. 140.



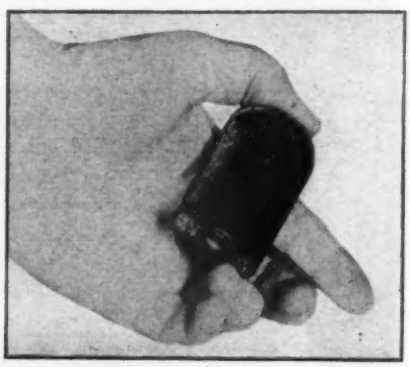
PARTS WASHER—*Sturdy-Bilt Equipment Corp., West Allis, Wis.* The Simplex metal parts washer is equipped with a lever operated tray-motor powered for raising and lowering into the soaking tank. Apr. 29, 1943, p. 124.



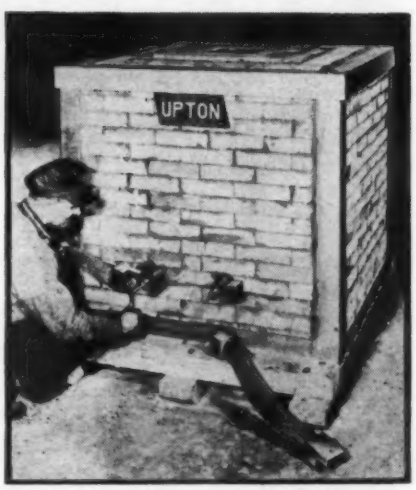
SALT BATH FURNACE—*Upton Electric Furnace Div., 7450 Melville Ave., Detroit, Mich.* This electric furnace features the use of three electrodes fastened to the water-cooled bus bars by single-bolt connection. Jan. 7, 1943, p. 122.

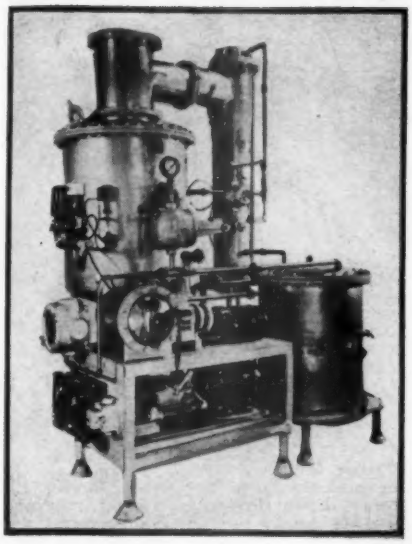
SALT BATH FURNACE—*Upton Electric Furnace Div., 7450 Melville, Detroit, Mich.* Necessity for changing electrodes has been eliminated in this equipment which provides for placing them beneath surface of salt or at bottom of pot. Temperatures from 1200 to 2500 F are used. Aug. 5, 1943, p. 128.

PARTS CLEANER — *Practical Products Co., 1629 University Ave., St. Paul, Minn.* The portable Kleer-Flo, which has 20-gal. capacity, features a safety link in the cover in case of fire. Apr. 15, 1943, p. 140.

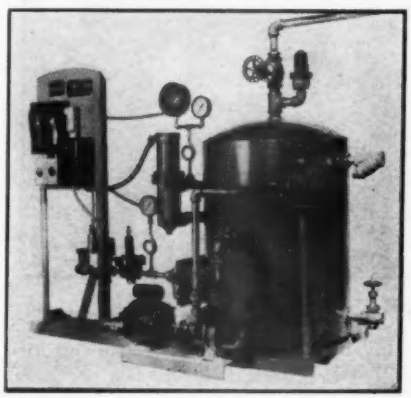


WIRE BRUSH—*Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, Ohio.* This rotary brush is designed to remove insulating material from very fine wires in electrical instruments without marring copper underneath. Feb. 18, 1943, p. 148.

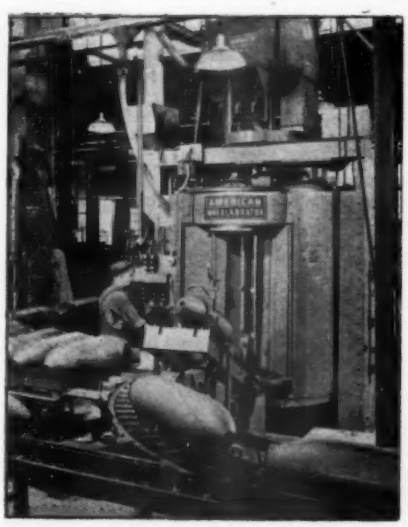




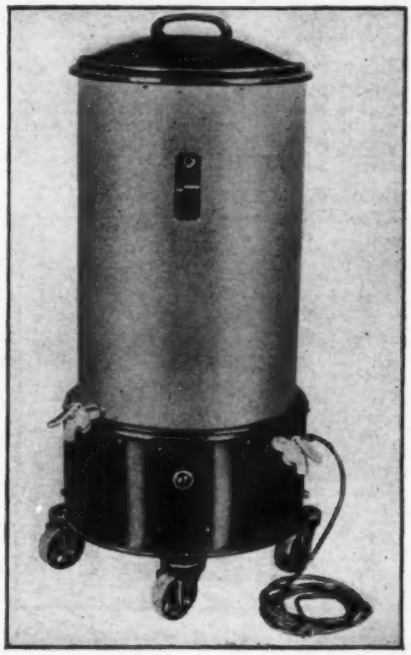
SOLVENT STILL—*Brighton Copper Works, 215 Colerain Ave., Cincinnati, Ohio.* This automatic still is used in reclaiming solvents and is made explosion-proof. July 8, 1943, p. 148.



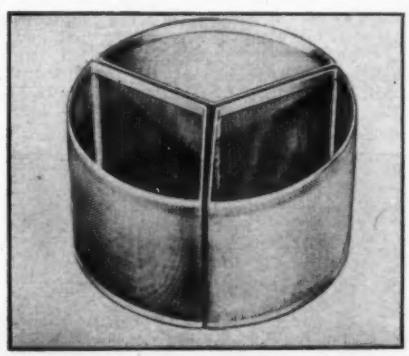
VAPOR CLEANER—*Circo Products Co., 2835 Chester Ave., Cleveland 14, Ohio.* This Dee Tee equipment is used for removing worn lubricant, dirt, grit and moisture from internal surfaces. Capacity of the tank is 35 gal. Aug. 19, 1943, p. 130.



CLEANER—*Colonial Alloys Co., Technical Processes Div., Philadelphia 34, Pa.* Running Gear Hydrocarbon cleaner has been developed for removing caked oil and grease. Not shown. Dec. 23, 1943, p. 136.



SOLVENT STILL—*Circo Products Co., 2835 Chester Ave., Cleveland, Ohio.* This unit is used for reclamation of oil-laden chlorinated hydrocarbon solvents and is known as the Dee-Solv still. Capacity is 19 gal. Feb. 18, 1943, p. 152.



CLEANING BASKET—*L & R Mfg. Co., 54 Clinton St., Newark, N. J.* This triple basket fits into the 3⅜ in. deep by 5½ in. diameter work basket of the company's industrial cleaning machine. Mar. 18, 1943, p. 130.

DEGREASER—*Magnus Chemical Co., Garwood, N. J.* This company has available a line of vapor and solvent degreasers which are air-cooled and permit boiling at high temperatures. Not shown. Apr. 29, 1943, p. 134.

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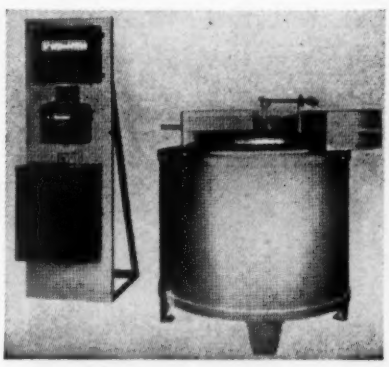
CLEANING MACHINE — *American Foundry Equipment Co., 555 Byrkit Ave., Mishawaka, Ind.* Interior and exterior surfaces of bombs can be cleaned in this automatic machine. It handles a wide range of sizes and types of shell. Jan. 7, 1943, p. 116.

CLEANERS — *Enthone Co., New Haven, Conn.* An emulsion cleaner ready for use has been developed by this company for cleaning oil, grease and dirt. The company also has an emulsion cleaner concentrate which is a base of strong emulsifiers mixed with solvent naphthas. Not shown. Nov. 11, 1943, p. 138.

ALUMINUM SOLUTION—*Colonial Alloys Co., Philadelphia, Pa.* Deox-Aluminum alkaline cleaning and deoxidizing solution is supplied as salts for mixing with water for use on all alloys of aluminum in the wrought cast or forged form. Not shown. Oct. 14, 1943, p. 146.

SOLVENT — *Curran Corp., Malden, Mass.* Carbon Met has been developed as a substitute for carbon tetrachloride for cleaning metal parts. Not shown. Apr. 15, 1943, p. 146.

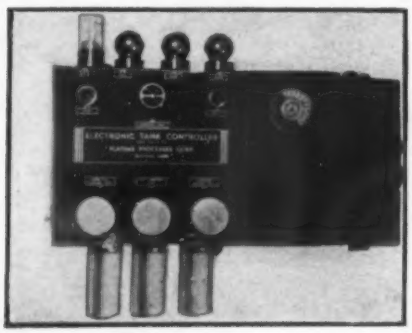
CLEANING BASKET—*Curran Corp., Malden, Mass.* A dunking and drying basket is fitted into a standard 5 gal. steel shipping pail containing Carbon Met, available from this company. June 24, 1943, p. 132.



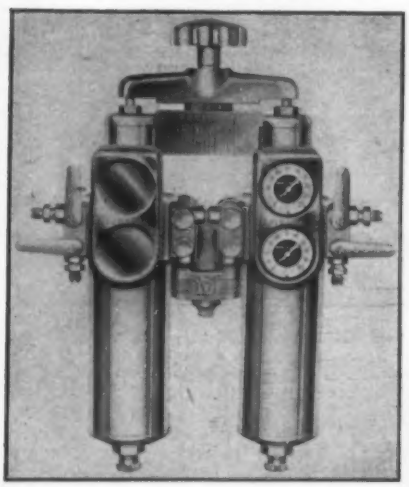
FURNACE—*H. O. Swoboda, Inc., 147 Thirteenth St., New Brighton, Pa.* The Falcon is a high-temperature salt bath furnace for cyanide hardening of tool steel products, also suited for regular thermal hardening. Maximum operating temperature is 1,650 F., but controls permit low temperatures for tempering. Apr. 15, 1943, p. 138.

GREASE CLEANER — *National Graphite Co., 17 John St., New York, N. Y.* Konag Castor cleaner is used for degreasing machinery, metal surfaces, parts, painted surfaces and concrete floors. Not shown. Apr. 29, 1943, p. 134.

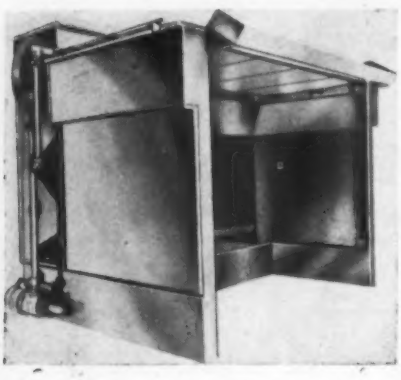
METAL COATING FINISH — *Chicago Vitreous Enamel Product Co., Cicero, Ill.* Armor-Vit forms a rust-resistant finish; applied by spraying or dipping. Not shown. Apr. 15, 1943, p. 146.

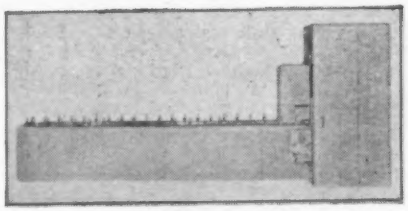


TANK CONTROLLER—*Plating Processes Corp., Holyoke, Mass.* Maintains plating solution level automatically, while controlling temperature. July 22, 1943, p. 140.

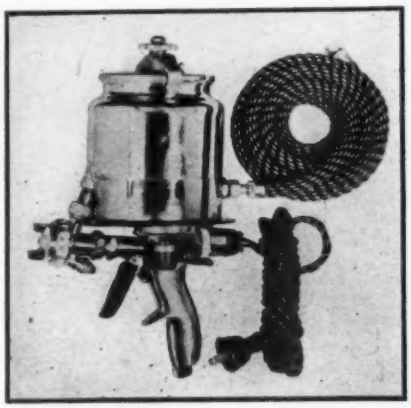


TRANSFORMER—*DeVilbiss Co., Toledo, Ohio.* Capacity of this double-barreled type HLC air transformer is in excess of 100 cu.ft. per min.; used on automatic spray painting installations. Feb. 4, 1943, p. 126.



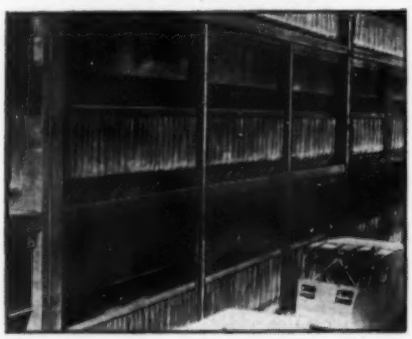


SHELL COATER—*DeVilbiss Co., Toledo, Ohio.* This shell coating equipment is arranged for automatic paint spraying inside and outside of shell varying in size from 20 to 155 mm. Jan. 7, 1943, p. 114.



AIRBRUSH—*Paasche Airbrush Co., 1909-1923 Diversey Parkway, Chicago 14, Ill.* This is an electrically-heated air-brush which heats both air and material; heat is thermostatically controlled from low of 180 F. to medium of 260 F. and high of 320 F. Oct. 28, 1943, p. 134.

PAINT—*S. C. Johnson & Son, Inc., Industrial Maintenance Div., Racine, Wis.* War-Formula paint has been developed by this company to replace the line of wax-fortified paint for the duration. Wide variety of colors including machine-tool gray are available. Not shown. Apr. 15, 1943, p. 142.

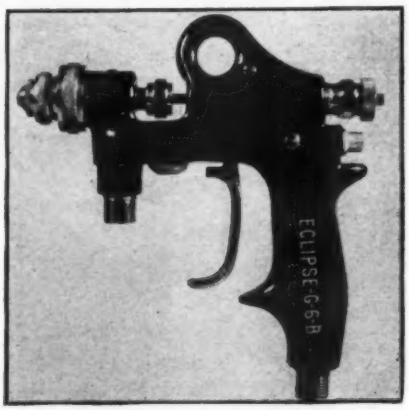


SPRAY BOOTH—*Binks Mfg. Co., 3114-40 Carroll Ave., Chicago, Ill.* These are 3-deck booths containing nine units in each row. Each tier has exhaust units of 70,000 cu.ft. per min. capacity. Feb. 4, 1943, p. 124.

SPRAY BOOTH—*Mayer Mfg. Corp., Aqua-Restor Div., 56 Division Pl., Brooklyn, N. Y.* This is a floor-type unit employing waterwash cleaning for larger parts finishing. Apr. 15, 1943, p. 140.

←

SPRAY GUN—*Binks Mfg. Co., 3114-40 Carroll Ave., Chicago, Ill.* Model 17 Thor with lusterless war finish has adjustable spray width from round to flat. Aug. 5, 1943, p. 130.



SPRAY GUN—*Eclipse Air Brush Co., 400 Park Ave., Newark, N. J.* This paint spray gun has a black plastic body with fittings of metal. Mar. 4, 1943, p. 136.

PLASTIC PAINT — *Calumet Plastic Co., Inc., 4702 Calumet Ave., Hammond, Ind.* Cracks, splits and joints can be sealed with this plastic liquid paint that expands and contracts with changing temperature. Not shown. Mar. 18, 1943, p. 142.

READY MIX PAINT — *Colorthru Chemical Co., 20 W. 45 St., New York, N. Y.* Colorthru is a ready mix primer and paint available for masonry. Not shown. Mar. 18, 1943, p. 142.

RUST REMOVER — *Wolfe-Kote Co., Sheboygan, Wis.* Irpo has been produced for rough-proofing painted or unpainted metal. It is an invisible oil applied to surface by spray, brush or cloth. Not shown. Aug. 19, 1943, p. 136.

VARNISH STRIPPER—*Sterling Varnish Co., 105 Ohio River Blvd., Haysville, Pa.* Sterling S-159 stripper is a blue viscous liquid for application to electric equipment such as rotors, stators, and armatures before varnish is applied. Not shown. May 13, 1943, p. 150.

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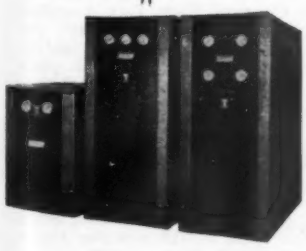

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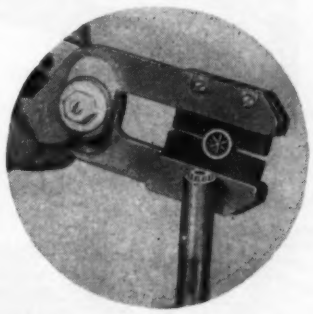

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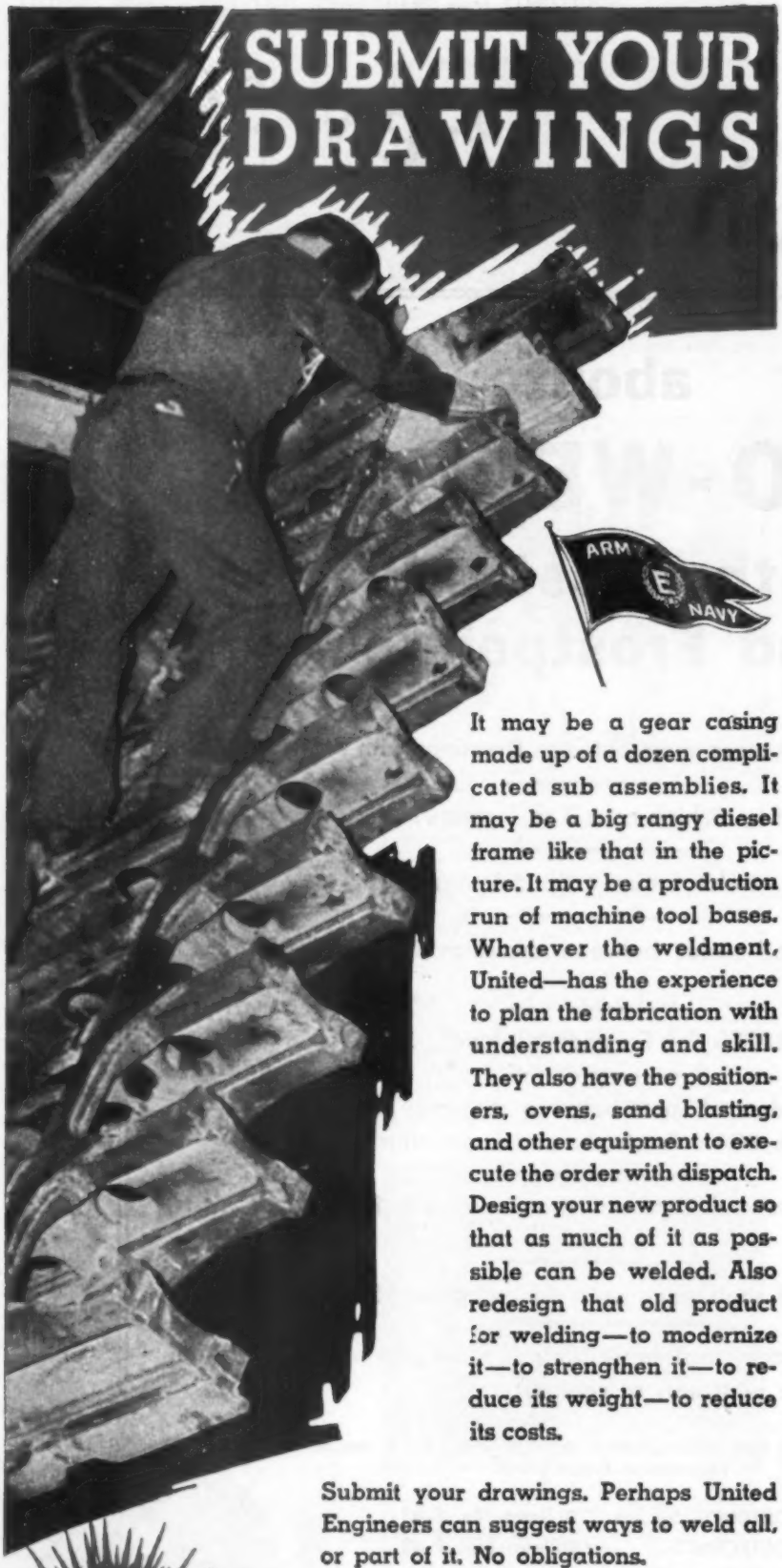

It may be a gear casing made up of a dozen complicated sub assemblies. It may be a big rangy diesel frame like that in the picture. It may be a production run of machine tool bases. Whatever the weldment, United—has the experience to plan the fabrication with understanding and skill. They also have the positioners, ovens, sand blasting, and other equipment to execute the order with dispatch. Design your new product so that as much of it as possible can be welded. Also redesign that old product for welding—to modernize it—to strengthen it—to reduce its weight—to reduce its costs.

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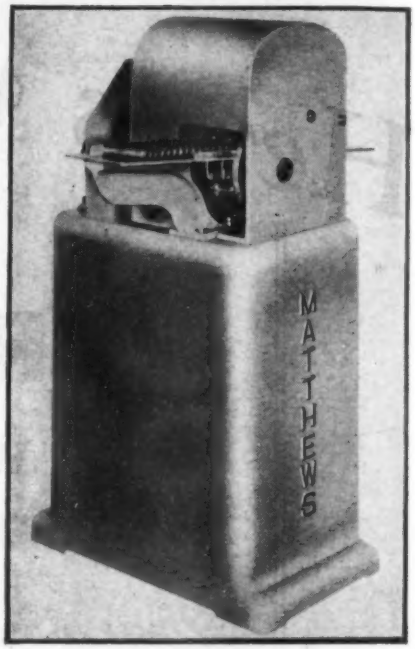

PRINTING MACHINE—*Jas. H. Matthews & Co., 3942 Forbes St., Pittsburgh, Pa.* This No. 301 machine prints color bands, insignia and other data on cylindrical bodies. Apr. 1, 1943, p. 116.

PAINT—*Park Chemical Co., 8074 Military Ave., Detroit, Mich.* No-Kase, a stop-off paint, has been produced for selective carburization on steel parts in liquid carburizing baths. Nov. 25, 1943, p. 136.

PAINT STICKS—*Markal Co., 6 E. Lake St., Chicago, Ill.* Markal N sticks are suited for metal, glass, wood, plastic; available in red, white, blue, green, yellow and black. Not shown. July 22, 1943, p. 140.

PROTECTIVE COATING — *Turco Products, Inc., 6135 S. Central Ave., Los Angeles, Calif.* Duramask is used on paint room floors and applied with a kalsomine brush. Suited also to protect machinery, walls, work benches and other surfaces from paint, oil or grease spillage. Not shown. No. 1. Jan. 7, 1943, p. 114.

PAINT COMPOUND—*Turco Products, Inc., 6135 S. Central Ave., Los Angeles, Calif.* Redi-Paint provides a base for permanent paint adhesive on galvanized metal without chipping or peeling. Not shown. Aug. 5, 1943, p. 138.

PAINT—*Modern Waterproofing Paint Co., 1270 Sixth Ave., New York, N. Y.* Aquella waterproofing mineral paint is used on concrete, cement and brick walls; available in white powder form. Not shown. Apr. 1, 1943, p. 130.

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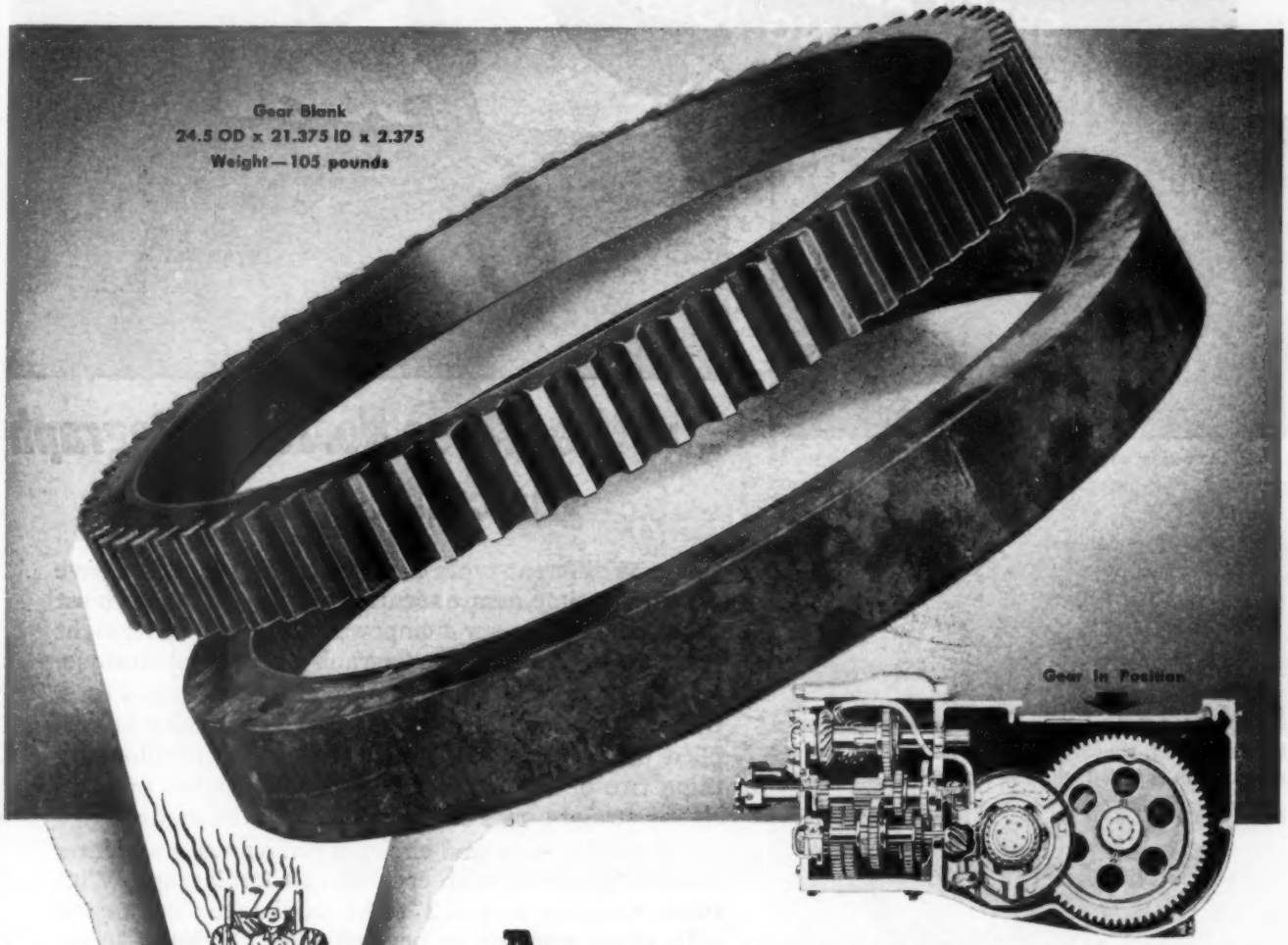

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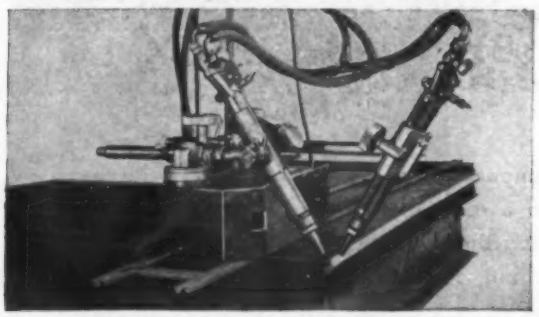

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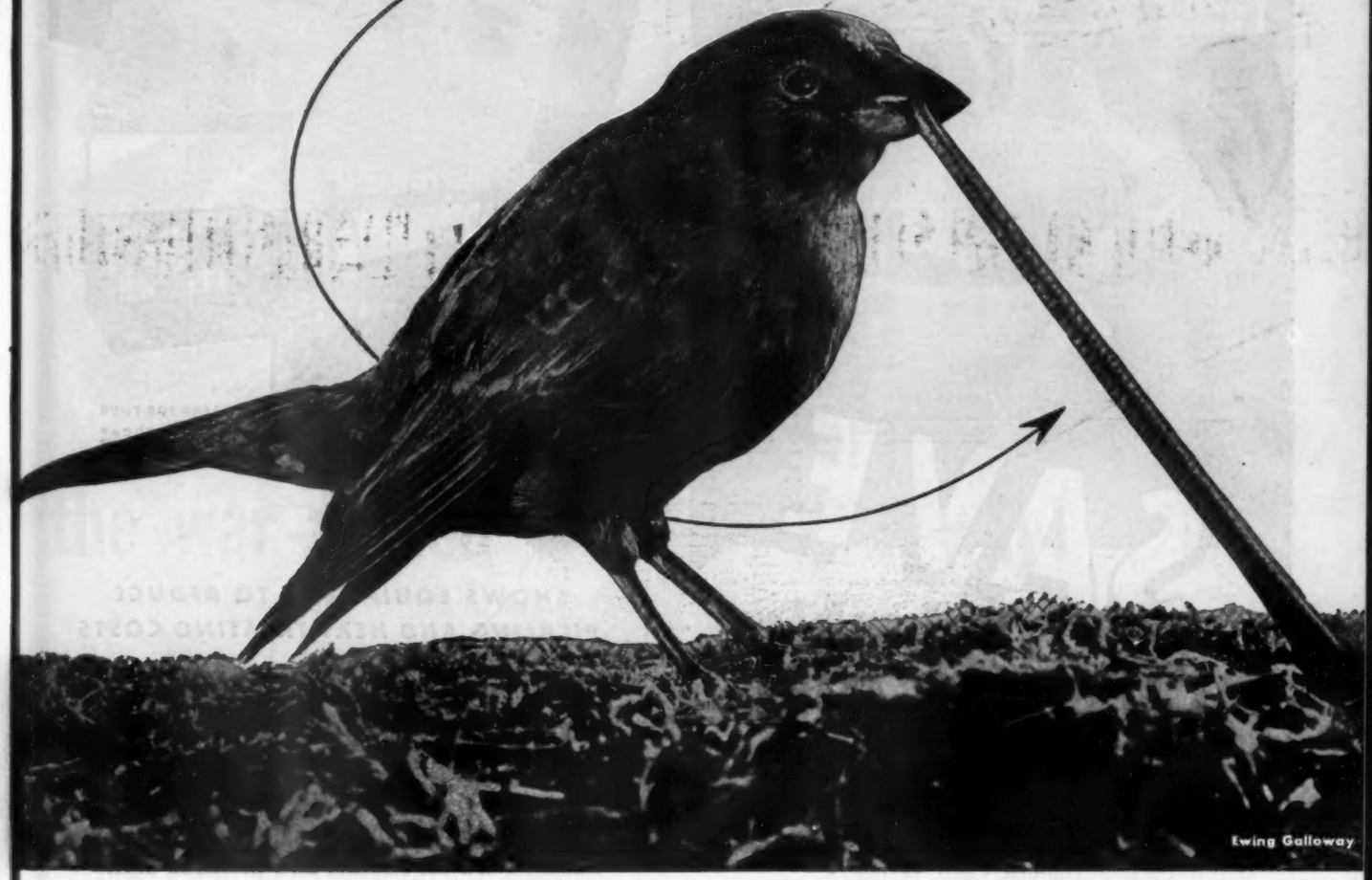

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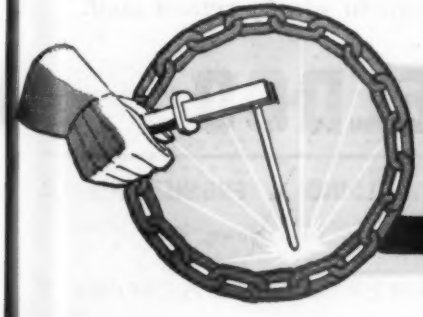

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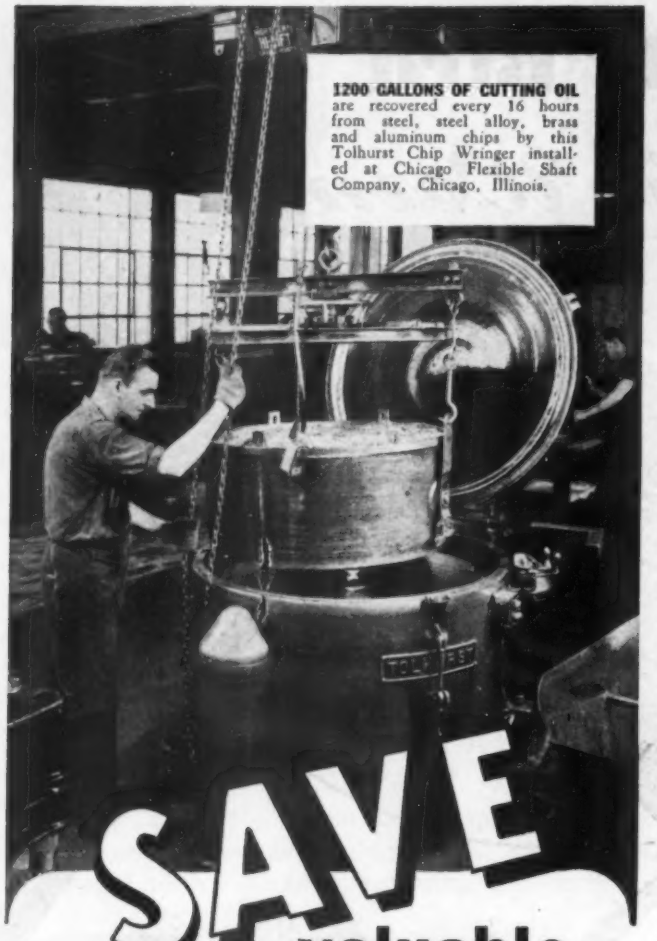
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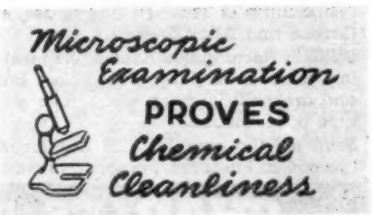

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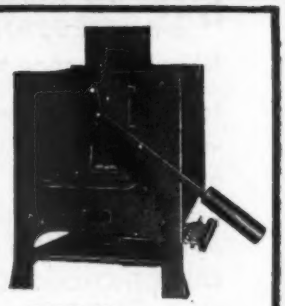

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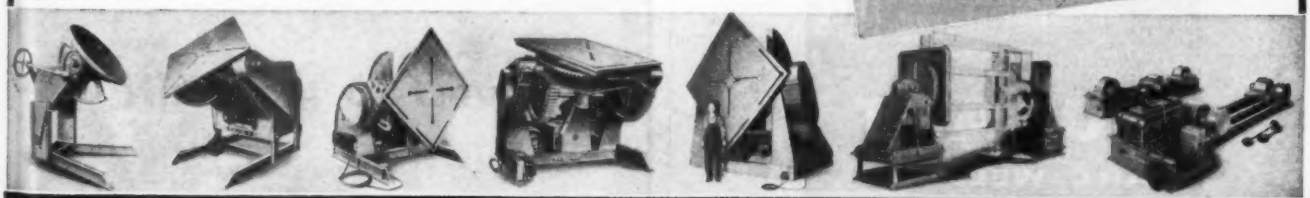

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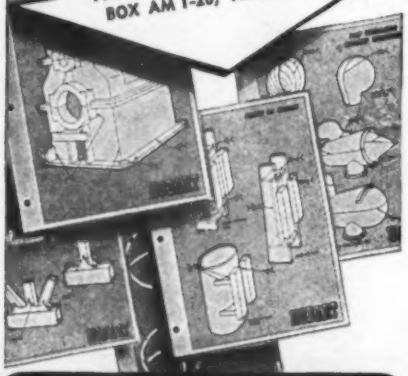

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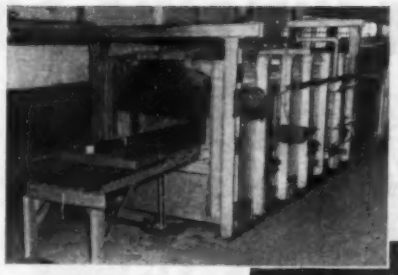
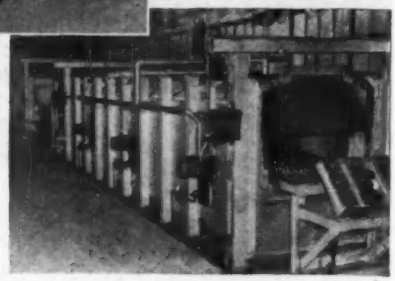


VULCAN
CONTINUOUS HARDENING, QUENCHING and DRAWING UNIT



For Treating Miscellaneous Steel Parts...

Hardening furnace has roller rail and hydraulic pusher, and operates at temperatures from 1400°F. to 1800°F. Quenching unit equipped with conveyor, recirculating system and automatically controlled cooling. Draw furnace is roller rail, pusher design, with three-zone automatic temperature control. Temperatures: 600°F. to 1400°F. Production of unit, 1000 lbs. to 1500 lbs. per hour on miscellaneous parts.

If you have a heating or heat treating problem, you can count on VULCAN to solve it in the most efficient, economical way. Send for representative.

VULCAN CORPORATION
1737 CHERRY STREET, PHILADELPHIA, PA.

WAR BONDS

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WAR WEAPONS

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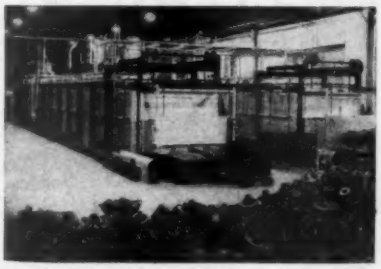
Invest to the limit!

Some EF Gas Fired, Oil Fired, and Electric Furnaces — Production Furnaces Engineered to Fit the Job

Roller Rail Pusher Furnaces

For annealing, heat treating, short cycle malleablizing, etc.



Used for handling miscellaneous products. The material is carried through the furnace in light baskets or trays. 40,000 pounds of malleable castings per day are annealed scale free in the above special atmosphere furnaces.

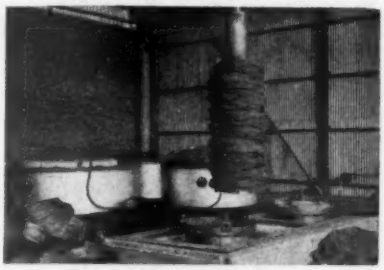
Chain Belt Conveyor Furnaces

For continuous heat treating small and medium sized products

For scale free hardening bolts, gears, bearing parts, springs, and miscellaneous other products in quantities. Material is loaded directly on belt, carried through the furnace and automatically quenched or otherwise discharged.

Pit Type Furnaces

Rectangular, Circular or other types



An efficient furnace with excellent temperature distribution. Large rectangular pits are used for annealing steel bars, tubing, etc. Circular types for various ferrous and non-ferrous products. Above installation is annealing coiled wire, and normalizing rod.

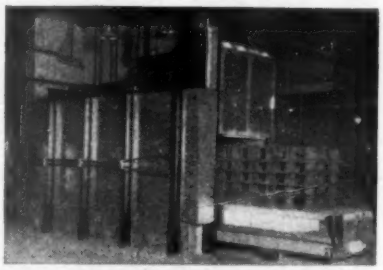
Suspended Conveyor Furnaces

For handling various products and processes

For continuous heat treating metal parts, glass, vitreous enameling, etc. The work is suspended on hooks and carried through the equipment. The above installation is a continuous unit for hardening, drawing, and automatic quenching automobile axles.

Car Type Furnaces

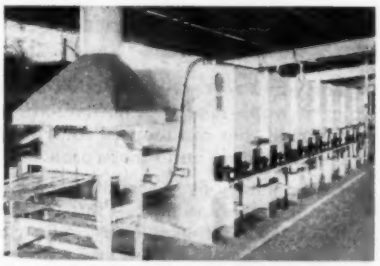
For annealing and various heat treating processes.



Used for annealing castings, bar stock, plates, stress relieving welded structures, heat treating and carburizing armor plate, etc. The above single ended car type furnace is annealing steel castings. Car type furnaces may be built to handle any size product.

Roller Hearth Conveyor Furnaces

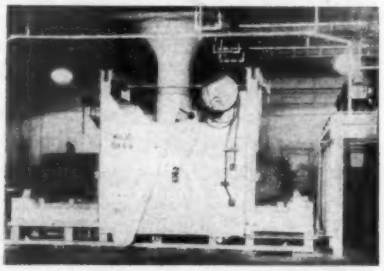
For hardening, annealing, copper brazing, etc.



The material is conveyed through directly on roller hearth or on trays. Used for hardening gears and other finished parts, annealing strip, tubing, castings, etc. Also for copper brazing, normalizing, and other processes. Above installation is bright annealing steel strip.

Reciprocating Type Furnaces

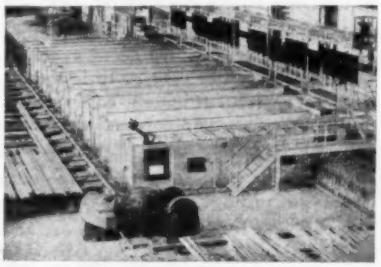
For nitriding and other special atmosphere treatments



Similar to car type, but furnace moves and base remains stationary. Used for nitriding and other special atmosphere treatments where permanent connections to retorts are desired. Above furnace is nitriding aircraft engine parts.

Large Automatic Conveyor Hearth Types

For various heat treating processes and products

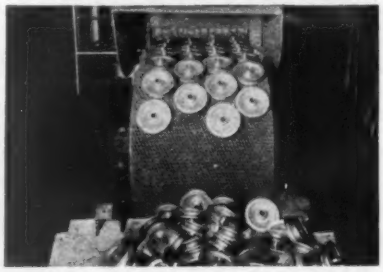


Structural shapes up to 90 feet long are automatically charged into the above furnace, carried across the heating chamber and discharged through a spray quench—everything is automatic. Uniform temperature is maintained throughout the 93 x 26-ft. heating chamber.

Mesh Belt Conveyor Furnaces

For copper brazing, drawing, etc.

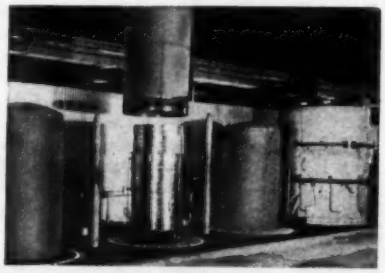
Material is loaded directly on belt. At right illustration shows discharge end of a continuous furnace copper brazing fan pulley assemblies. The completed unit is discharged securely joined, clean, and bright.



Bell or Hood Type Furnaces

For annealing wire, strip, nitriding, etc.

Charges are placed on fixed bases, furnace is placed in position by crane or hoist. Inner cover contains protective atmosphere. May have forced convection to promote speed of heating or temperature distribution. This installation is bright annealing steel strip.



Additional information on above or other types of EF production furnaces gladly sent on request

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- Forty-five years of doing one thing—and doing it well—means an accumulation of sure-footed skill that can be used to avoid mistakes, improve procedure, build more profitable business operation.
- Kester's forty-five years of developing, making and improving soldering alloys and fluxes—forty-five years of experience in their practical application to every industrial use—offers a unique advantage to manufacturers and maintenance and service men.
- Kester's store of knowledge about solder is at your service! Kester engineers and laboratory technicians will gladly assist you, without obligation, in setting up any soldering operation to obtain smoothest production, best and most profitable results.
- Kester Solder products—the famous Cored Solders, fluxing compounds, wire solders and specialties—offer a complete and outstanding solder service to industry. Kester patents, based on years of careful research, cover many important and exclusive developments—acid-core solder that *positively will not leak*, and a plastic rosin flux that *will not disintegrate*, to mention only two.
- Whatever your solder requirements, put them up to Kester! You'll get prompt, skillful cooperation!

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TIN ORDER AMENDED. For the present, if you require solder of more than 20% tin content, certify use on Kester orders; under WPB Order M-43 as amended November 3, 1943. Priorities Preference Ratings now govern only the scheduling of deliveries.

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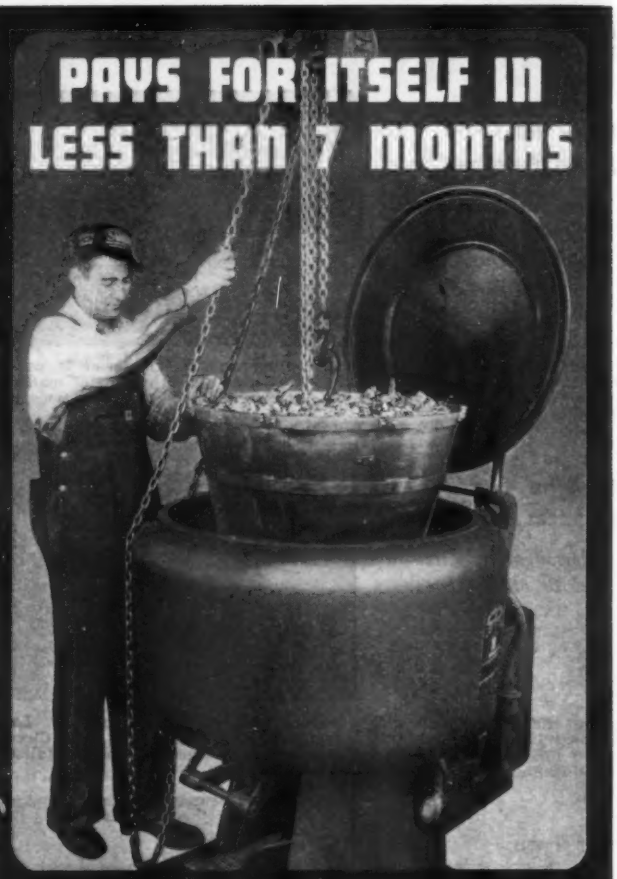
Cored Solders
STANDARD FOR INDUSTRY

PAYS FOR ITSELF IN LESS THAN 7 MONTHS



Actual figures from a New York manufacturer* show a net saving of $36.61 a week with their American Chip Wringer, *after labor costs have been deducted*. At this rate of saving, the manufacturer says the American Chip Wringer will pay for itself in *less than 7 months*. After that the saving will be clear profit . . . month after month.

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American Chip Wringers are available in following models: 220, 226, 230, 240, 248.

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WHEN a large mid-western war plant converted to the manufacture of an important chemical bomb, it looked for a while as if production would be seriously limited. Chief cause of this threatened bottleneck lay in the joining of the cylindrical center section—the operation you see pictured here.

Today, thanks to Mallory skill and experience, the problem is solved and the bottleneck removed. The core of the bomb is quickly joined by Mallory resistance seam welding electrodes. These are made of tough Mallory 3 Metal. Throughout the entire welding operation, wheel and weld are constantly cooled by a running stream of water.

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Naturally, this is a story the enemy doesn't like. But then, the whole trend of Mallory advancement is running against the Axis tide. In scores of other factories today, Mallory engineering has resulted in longer electrode life . . . welds of higher strength and consistency . . . faster, better wartime production—frequently at lower cost. This same experience is ready to be of service to you—no matter what your welding problem, or to what kind of product it happens to apply. Write today for the comprehensive Mallory Resistance Welding Data Book.

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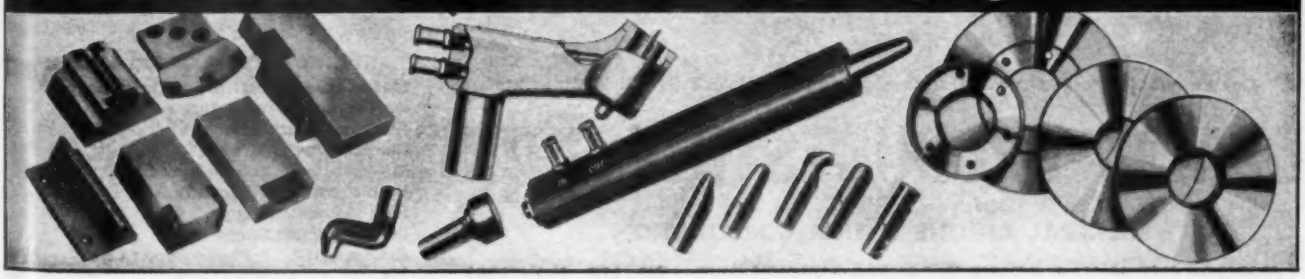
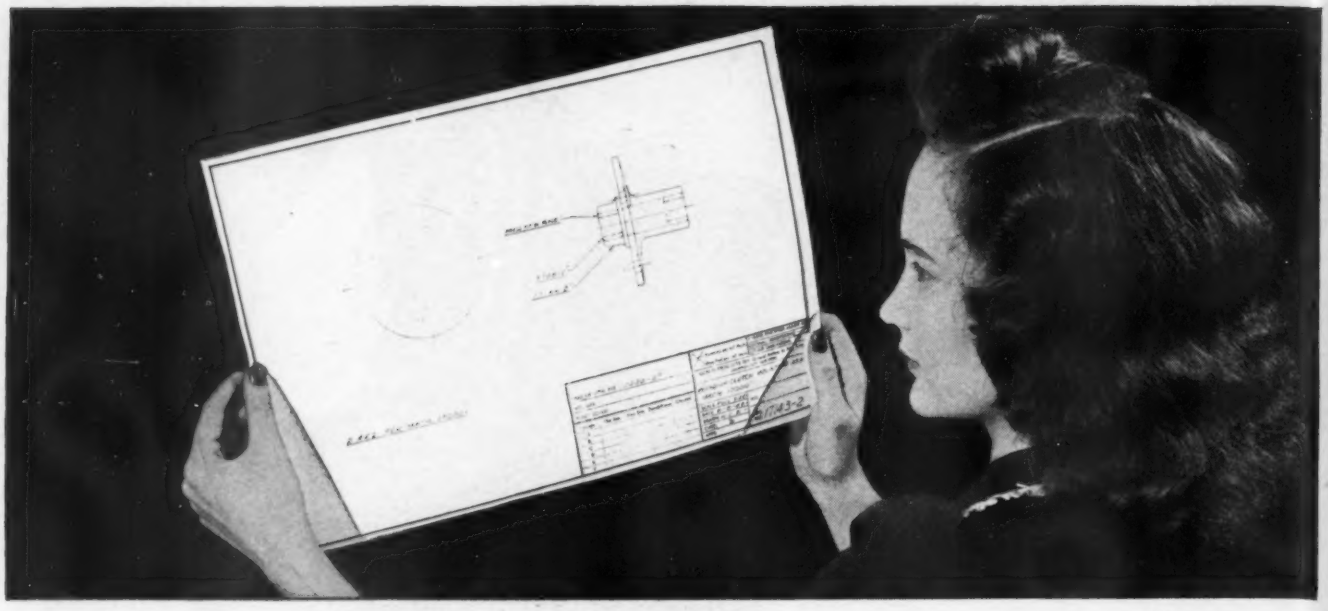
P. R. MALLORY & CO. Inc

MALLORY *Standardized Resistance Welding Electrodes*

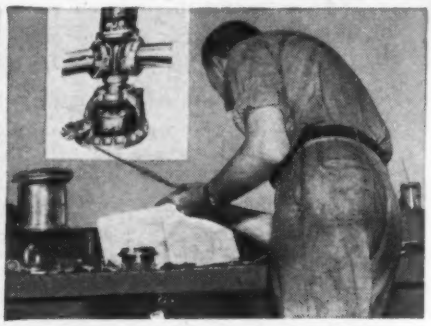




Look at this print from all sides

You'll probably agree that this Ozalid whiteprint is easier to read than a blueprint.

That's one feature—but now go behind the scenes. Look at Ozalid from all sides. Count the advantages it has over any other technical reproduction process.



1. PRODUCTION

Ozalid whiteprints are the easiest to produce. That's because chemical baths and driers are eliminated.

An Ozalid machine turns out positive reproductions of your engineering drawings, charts, letters, in one continuous operation which incorporates Exposure and Dry Development. All of Ozalid's standard and transparent materials are processed this way. What's more, you can use cut sheets as well as roll stock, thereby eliminating trimming waste.

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Ozalid whiteprints will have blue, black, or maroon lines on a white background depending upon your choice of paper. You can assign identifying colors to prints of different departments . . . distinguish checked from unchecked prints . . . establish a print control system which will lessen the possibility of loss or error.

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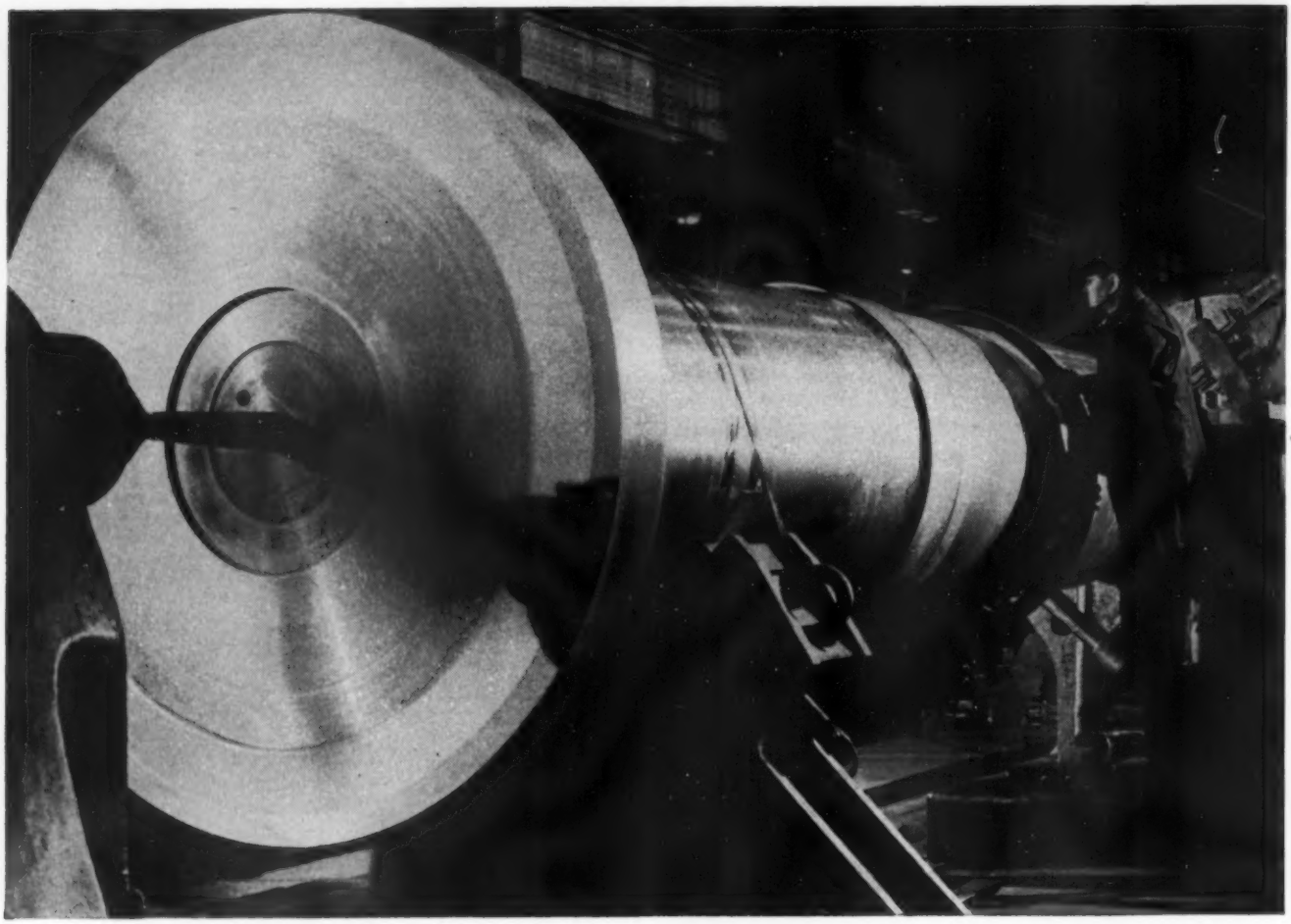
JANUARY 20, 1944



Close Shave

WHETHER machining a forging for a 75-ton shaft or turning out delicate parts for aviation instruments, American mass production methods are employed.

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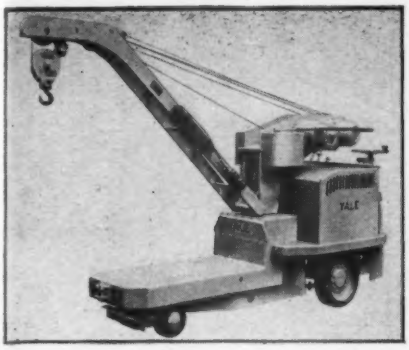
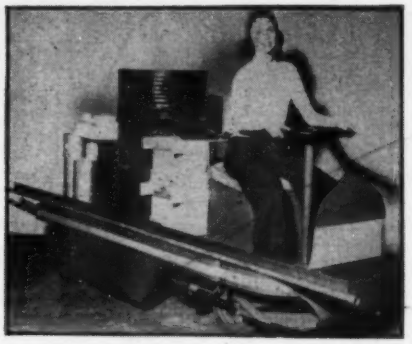
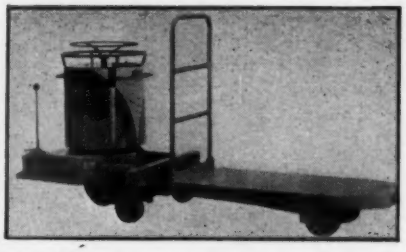


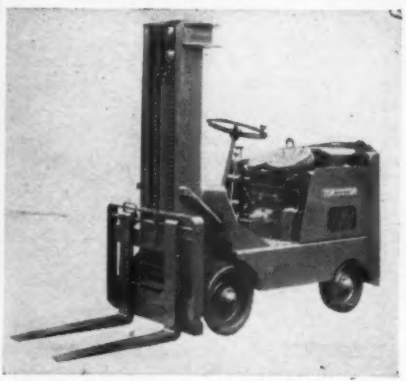
CRANE—*Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia, Pa.* The twin unit crane combines a 6,000-lb. capacity low elevating platform truck and a 2,000-lb. crane. June 24, 1943, p. 140.



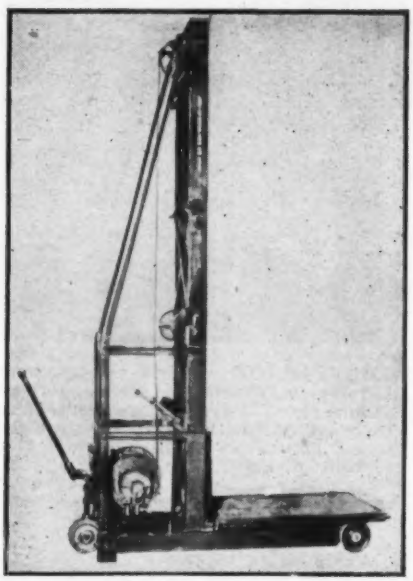
PLATFORM TRUCK — *Rocky Mountain Steel Products Co., 1346 Wall St., Los Angeles, Calif.* The Blue Streak ½-ton truck is electrically operated and turns on a small radius. Apr. 1, 1943, p. 126.



TURRET TRUCK—*Nutting Truck & Caster Co., Faribault, Minn.* This lift-type truck has a hand-operated hydraulic lever and platform taper. June 10, 1943, p. 130.

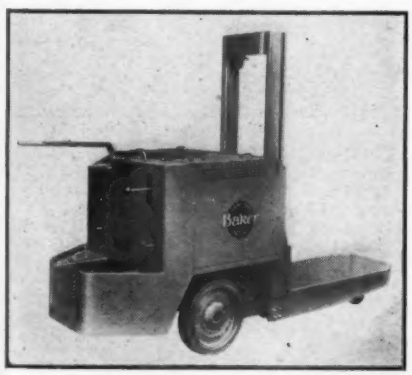


TRUCK — *Towmotor Co., Cleveland 10, Ohio.* LT-50 lift truck is available with 104 or 144 in. lift for 5,000 lb. capacity, or for 4,000 lb. capacity with 144 in. lift. Oct. 28, 1943, p. 124.

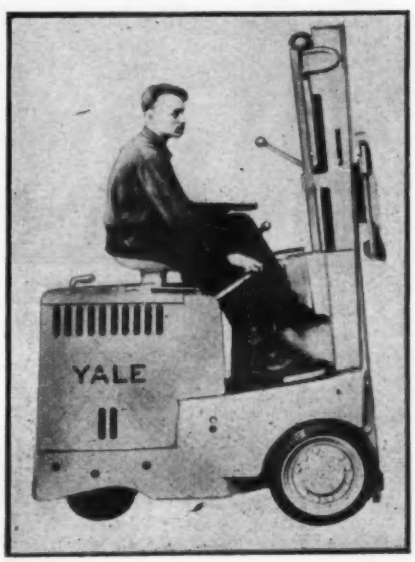


STACKER — *Lewis-Shepard Sales Corp., Watertown, Mass.* The air power stacker is essentially a portable elevator for use in connection with various hazardous operations. May 13, 1943, p. 146.

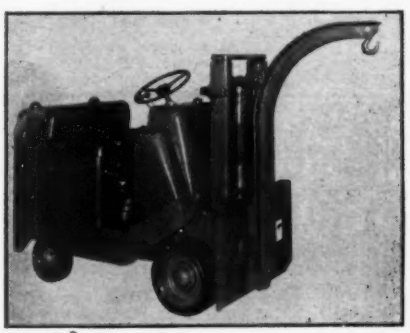
LIFT TRUCK — *Barrett-Cravens Co., 3255 W. 30 St., Chicago, Ill.* The Powertruck is a combination hand and electric lift unit with 4,000 lb. capacity. Mar. 4, 1943, p. 134.



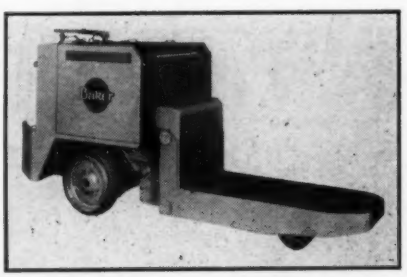
TRUCK—*Baker-Raulang Co., 2168 W. 25 St., Cleveland, Ohio.* This Hy-Lift truck has 4,000 lb. capacity and can be used interchangeably with material handling system with Type E-2 unit. Sept. 16, 1943, p. 136.



LIFT TRUCK—*Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia, Pa.* Loads up to 2,000 lb. can be handled with this bantam size telescopic lift, tilting fork truck. May 13, 1943, p. 146.

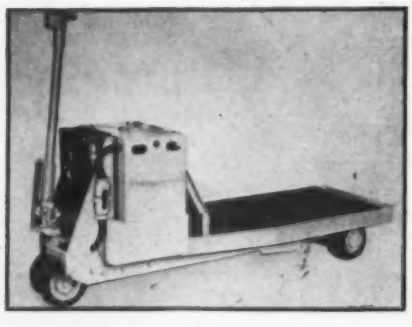


LIFT TRUCK—*Towmotor Co., 1226 E. 152 St., Cleveland, Ohio.* This lift truck features a crane arm attachment which may be used with or without forks. Mar. 4, 1943, p. 136.

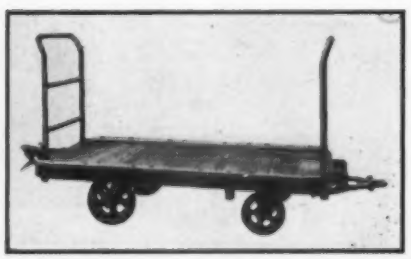


TRUCK—*Baker Industrial Truck Div., Baker-Raulang Co., 2168 W. 25 St., Cleveland, Ohio.* Type E-2 low-lift truck, with separate skid platform, transports 4,000 lb. loads. Aug. 5, 1943, p. 134.

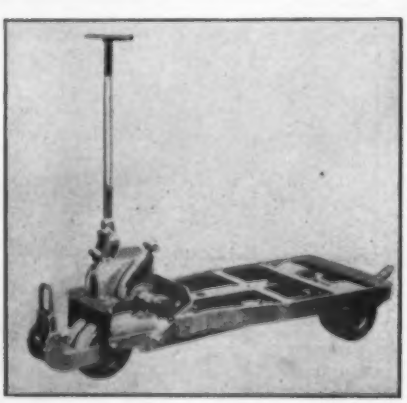
POWER TRUCK—*Nutting Truck & Caster Co., Faribault, Minn.* The Salsbury industrial truck is available in lift, cargo and tractor types. Features include automatic clutch and self-shifting transmission. Jan. 7, 1943, p. 116.

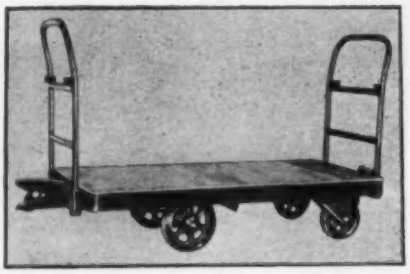


MOTORIZED TRUCK — *Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati, Ohio.* The HydroLectric truck handles loads of 4,000 lb., and has two-button control on the handle; furnished in width of 26¾ in. and heights of 9 or 11 in. Jan. 7, 1943, p. 122.

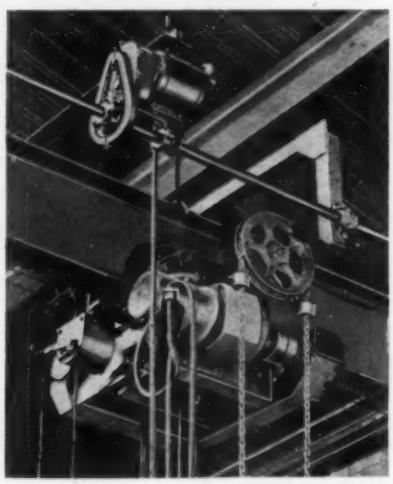


TRUCK—*Rose Manufacturing, Detroit, Mich.* Distributed by *H. L. Pitcher Co., Strathmoor at Fullerton, Detroit, Mich.* Model 610 all-purpose industrial trailer is equipped with an automatic hitch. Sept. 30, 1943, p. 118.

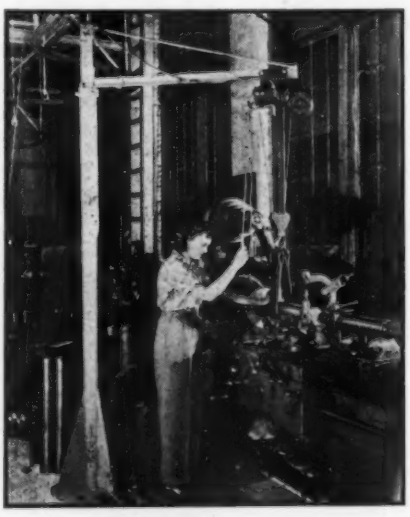




TRAILER TRUCK — *West Bend Equipment Corp., West Bend, Wis.* The Weld-Bilt truck is made for hand use, and is equipped with a hitch for trailer use. Mar. 18, 1943, p. 138.



TRAVELATOR — *Northern Engineering Works, Atwater at Chene, Detroit, Mich.* Hand travel bridge cranes can be provided with motor travel in a few hours by means of this device. Dec. 9, 1943, p. 128.



HOIST—*Master Electric Co., Industrial Equipment Div., Dayton, Ohio.* Cablemaster, equipped with hook or trolley mount, fits monorail or jib crane. Capacities from 250 to 1,000 lb. are available. Aug. 5, 1943, p. 130.

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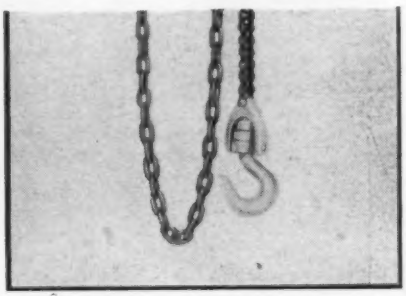
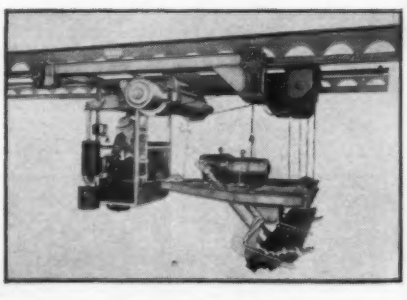
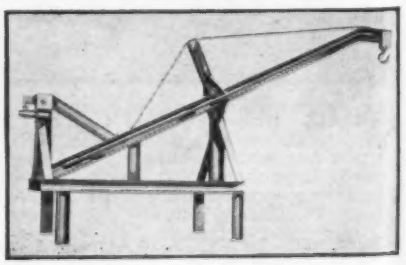
LIFT TRUCK—*Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia, Pa.* The Load King is a trailer-type hand lift truck fitted with safety self-coupler front and rear. Mar. 18, 1943, p. 136.

CHAIN HOISTS—*Manning, Maxwell & Moore, Budgit Chain Block Div., Muskegon, Mich.* A line of high-speed spur geared Budgit chain hoists are available in ¼ to 2 ton lifting capacity with lightweight construction. Oct. 28, 1943, p. 136.

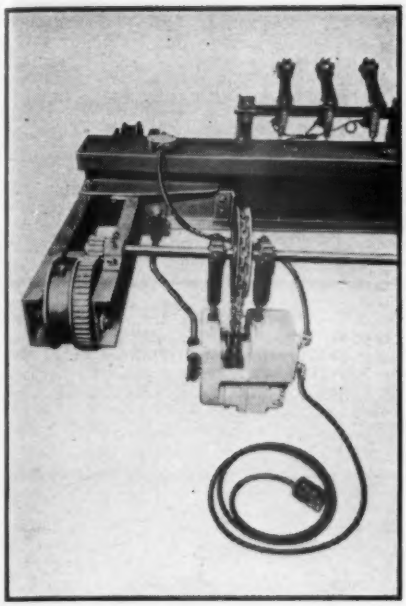




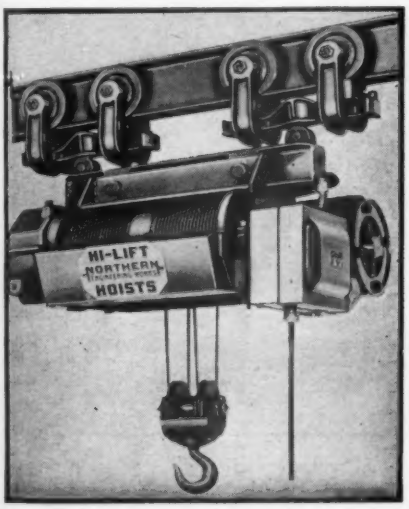
CARRIER—*Cleveland Crane & Engineering Co., Cleveland Tramrail Div., Wickliffe, Ohio.* The motor-driven pipe and rod carrier handles up to 1,500 lb. of stock in 12 ft. lengths. July 8, 1943, p. 144.



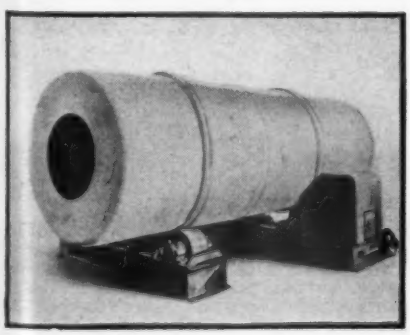
BOOM SKID — *Palmer-Shile Co., 780 So. Harrington St., Detroit, Mich.* This unit for attaching to high-lift or fork trucks is capable of picking up and moving heavy objects; measures 114 in. long. May 13, 1943, p. 148.

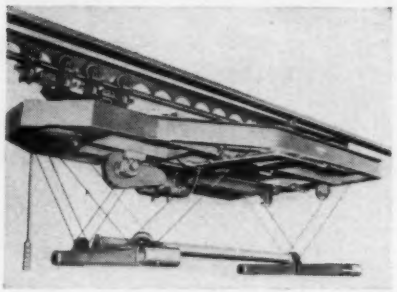


BRIDGE DRIVE—*Manning, Maxwell & Moore, Budgit Products Div., Muskegon, Mich.* Bridge travel motion of hand-operated cranes can be converted to electric drive with this self-contained unit. Oct. 28, 1943, p. 130.

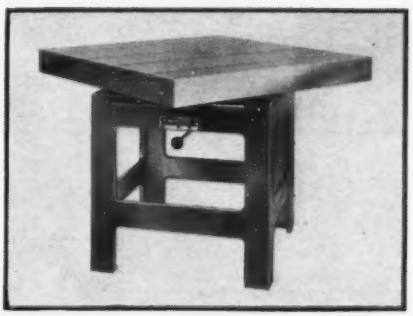


HOIST—*Northern Engineering Works, 2615 Atwater St., Detroit, Mich.* This line of equipment from 1 ton up is suited for operation on various types of special section monorail track system. Apr. 15, 1943, p. 144.





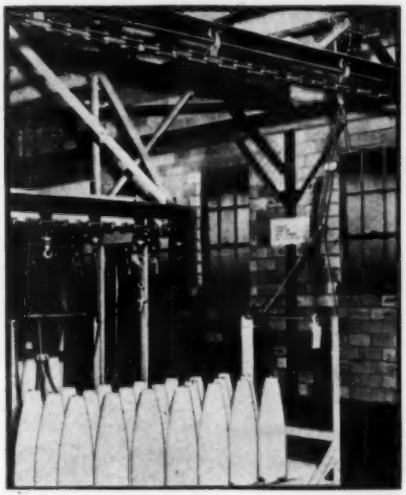
TRAMRAIL CARRIER — *Cleveland Crane & Engineering Co., Cleveland Tramrail Div., Wickliffe, Ohio.* This carrier holds a load rigidly in place by use of ropes even if it is unbalanced; is available for capacities of 1, 3 and 5 tons, hand or electrically propelled. Mar. 4, 1943, p. 134.



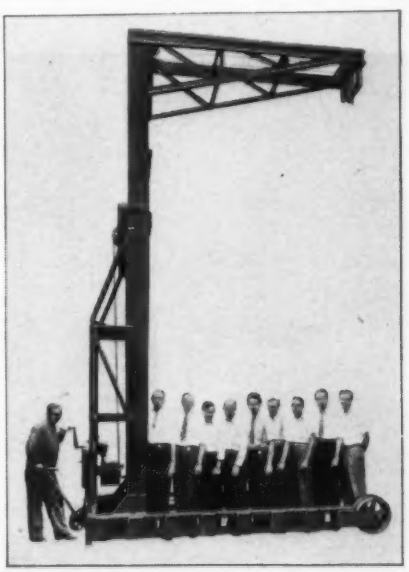
TURNTABLE — *Challenge Machinery Co., Grand Haven, Mich.* Progressive mounting of two or more units at one time can be handled on this table, available mounted on a stand or as a low base model. Aug. 5, 1943, p. 128.

ELEVATING TABLE — *Lyon-Raymond Corp., 1211 Madison St., Greene, N. Y.* Dies and weldments can be accommodated on this swivel-top table which is 30 in. square and has a 14 in. elevation. Aug. 19, 1943, p. 136.

TURNING ROLLS — *Ransome Machinery Co., Industrial Div., Dunellen, N. J.* Motor-driven rolls are used for position-welding long drums, tanks and other heavy cylindrical pieces; the set consists of a pair of motor-driven rolls, controlled through Reeves variable-speed unit; units of various capacities handle loads up to 75 tons. May 27, 1943, p. 133.



CONVEYOR UNIT — *Alvey-Ferguson Co., 71 Disney St., Cincinnati, Ohio.* This is built for tow trucks to pull through subassembly and final assembly. Towing hook can be detached by hand or automatically. June 24, 1943, p. 140.

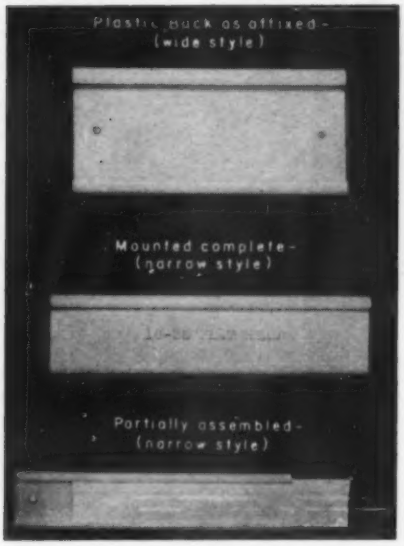


PORTABLE CRANE—*Barrett-Cravens Co., 3255 W. 30 St., Chicago, Ill.* Capacity of this portable crane is 4,000 lb. and lifting height is 20 ft. Mar. 4, 1943, p. 124.

UTILITY CAN—*Arvey Corp., 3462 N. Kimball Ave., Chicago, Ill.* This company has available a 20-gal. capacity single-ply impregnated fiber utility can that is water-resistant. Not shown. Apr. 1, 1943, p. 128.

SPARE PARTS BOX—*American Metal Works, Inc., 1509 Germantown Ave., Philadelphia, Pa.* This unit is of steel construction and made in a variety of sizes; equipped with hasps, heavy hinges and drop handles. Not shown. Feb. 4, 1943, p. 128.

SPARE PARTS BOX—*Stackbin Corp., 42 Troy St., Providence, R. I.* An all-welded parts box is available in a variety of sizes and styles, equipped with cover and handle. Not shown. May 27, 1943, p. 148.

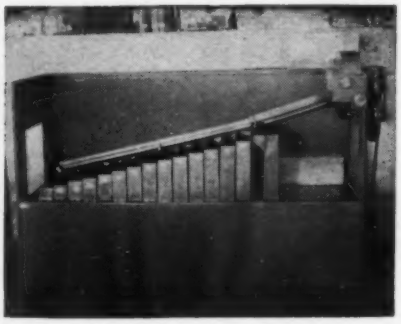


CARD HOLDER—*Hollywood Athletic Co., Plastic Div., 211 E. Seventh St., Los Angeles 14, Calif.* A variety of shapes and sizes is available in the plastic stockbin card holders made in widths of ⅝, ⅞, 1 7/16 in. Oct. 14, 1943, p. 156.

PROTECTIVE JACKET—*Metal Textile Corp., Orange, N. J.* The Metex jacket or boot protects superfinish and fragile parts in process and packing. Available in all diameters and lengths. Aug. 5, 1943, p. 136.

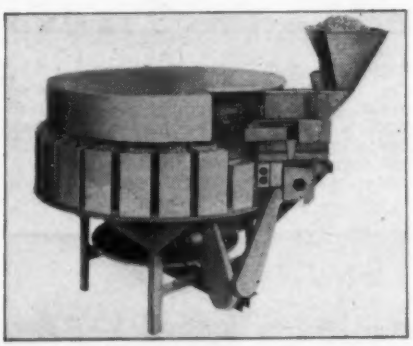
TOTER—*Arvey Corp., 3462 N. Kimball Ave., Chicago, Ill.* This is a water and oil resistant fiber toter for carrying small machined parts. Available in three sizes. Not shown. Mar. 18, 1943, p. 136.

CARRIER FRAMES — *Lyon Metal Products, Inc., Aurora, Ill.* Two sizes are available with built-up wood liners for storing and protecting precision machined parts. Not shown. Mar. 4, 1943, p. 126.

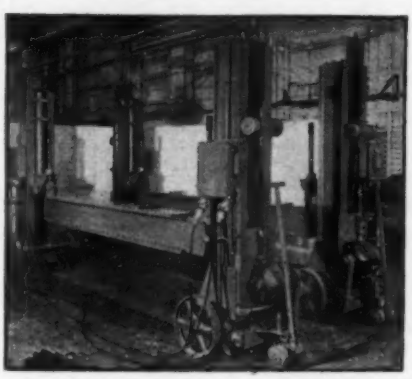


RIVET SORTER—*Engel Aircraft Specialties, Escondido, Calif.* Rivets, screws or bolts can be sorted by length, head or diameter. June 24, 1943, p. 128.

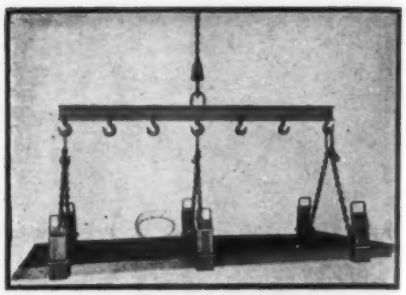
WOOD PALLETS—*Palmer-Shile Co., 780 S. Harrington Ave., Detroit, Mich.* These pallets suit power or hand form truck use. July 22, 1943, p. 138.



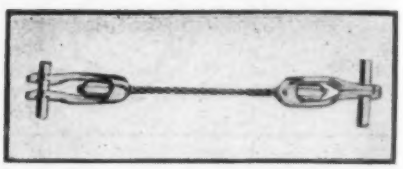
SCREW & RIVET SORTER—*Tubin Engineering & Mfg. Co., 764 S. San Pedro St., Los Angeles 14, Calif.* The machine automatically sorts to length dural, brass and steel screws, bolts and rivets. Nov. 11, 1943, p. 128.



LOCOMOTIVE JACK—*Whiting Corp., Harvey, Ill.* This is a portable high-lift, electric jack suitable for raising or lowering narrow or standard gage locomotive and passenger cars; lifting capacity is 140 tons. Feb. 4, 1943, p. 120.

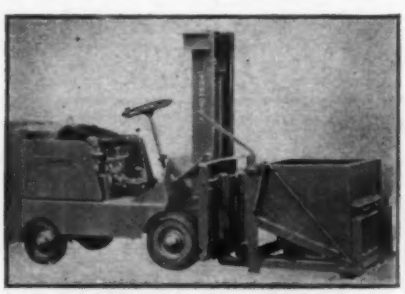


GRAB—*Palmer-Shile Co., 780 S. Harrington Ave., Detroit, Mich.* Short or long flexible bundles of sheet steel can be handled with this grab with lifting capacity up to 3 tons. July 8, 1943, p. 148.

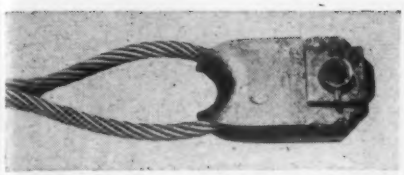


CABLE TERMINAL—*Poulsen & Nardon, Inc., 2665 Leonis Blvd., Los Angeles, Calif.* The Socketype unit is available in fork or eye type sockets to fit 1/16, 3/32, ⅛, 5/32 and 3/16 in. and larger cables. Aug. 5, 1943, p. 140.

BAR STOCK SLING — *Palmer-Shile Co., 780 S. Harrington, Detroit, Mich.* Loads up to one ton can be handled with this equipment which measures 5 ft. in length. Aug. 19, 1943, p. 138.



HOPPER ATTACHMENT—*Towmotor Corp., 1220 E. 152 St., Cleveland, Ohio.* This hopper attachment for lift trucks comes in various sizes; also serves as an independent unit. Mar. 18, 1943, p. 138.

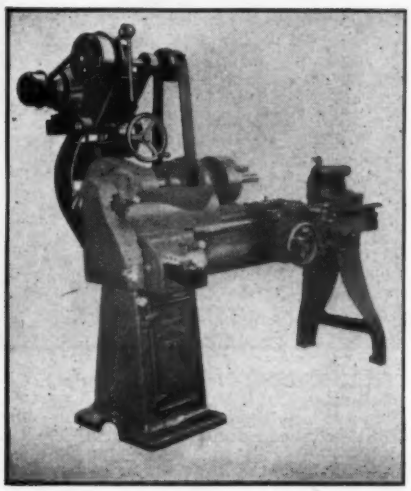


WIRE ROPE FITTING — *Garlinghouse Bros., 2416 East 26 St., Los Angeles 21, Calif.* The Gar-Bro Shimble fitting is a combination shackle and thimble adaptable to many uses wherever shackles or sprockets are used. Sept. 30, 1943, p. 124.

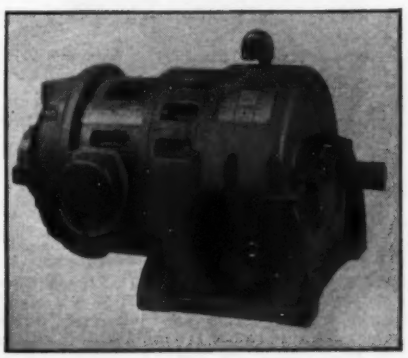
SLING—*MacWhyte Co., Kenosha, Wis.* An automatic equalizer features the Level-Lift sling which handles three tons with the single unit and six with the double. Aug. 19, 1943, p. 142.

DUMP BOX—*Union Metal Mfg. Co., Canton, Ohio.* The dump skid box has been developed for fork truck use. July 8, 1943, p. 148.

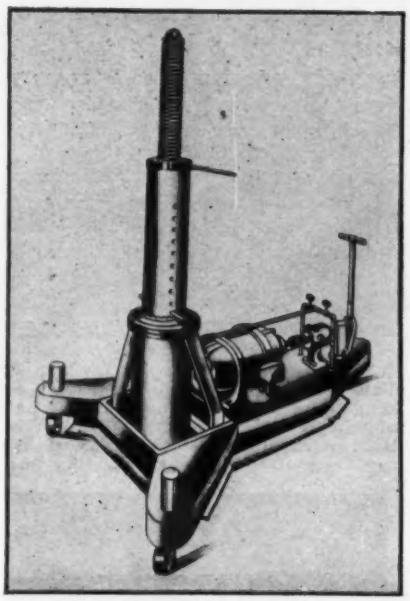
BENCH BINS—*Gordon L. Hall Co., Old Lyme, Conn.* Binracks for bench use range in capacities from ½ to 2 pt. Bench hopper bins are furnished in 4- and 8-in. widths. July 8, 1943, p. 148.



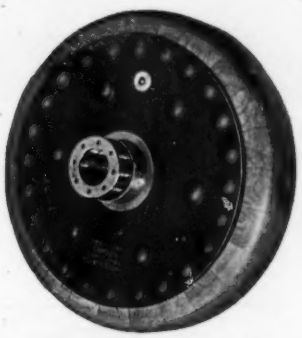
LATHE DRIVE—*Powermatic Machine Co., 659 S. Anderson St., Los Angeles, Calif.* A standard mounting bracket is used on this lathe drive, suited for attachment to any machine. Speed may be changed while machine is in operation or before starting. Jan. 7, 1943, p. 122.



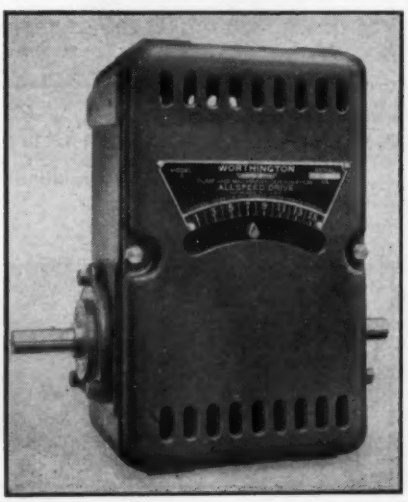
GEAR MOTOR — *Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.* For wide variety of industrial applications over a range of 1 to 75 hp., the company has developed a line of horizontal parallel shaft type gear motors to meet speed reduction requirements. July 8, 1943, p. 148.



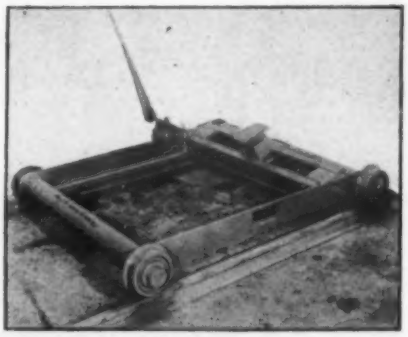
HYDRAULIC LIFT—*Globe Hoist Co., 1000 E. Mermaid Lane, Philadelphia, Pa.* Lifting height of the unit is 111¾ in. and 21,000 lb. lift capacity. Suited for aircraft assembly work. Feb. 18, 1943, p. 138.



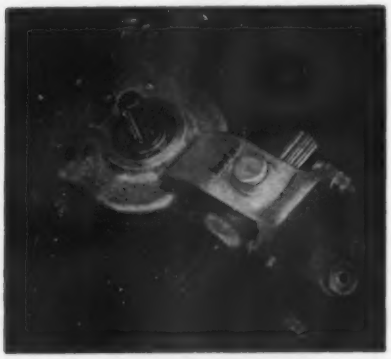
TRAILER WHEEL — *Metzger Co., Grand Rapids, Mich.* Hardwood is used for this wheel, with size ranges from 2½ to 20 in. diameter. Feb. 18, 1943, p. 140.



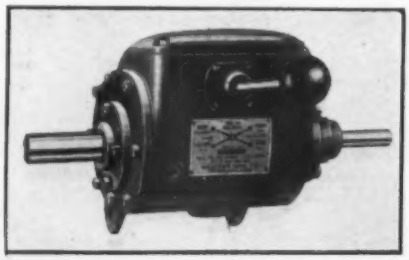
DRIVE—*Worthington Pump & Machinery Corp., Harrison, N. J.* Model A unit provides speed for ⅛ to twice motor speed and is adaptable to any machine. Sept. 2, 1943, p. 126.



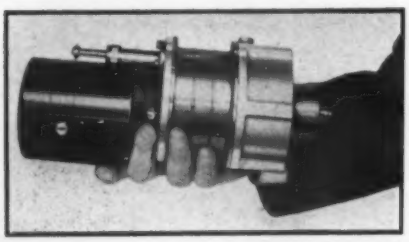
DOLLY—*Whiting Corp., Harvey, Ill.* This four-wheel dolly has elevating arrangement for removing mounted pair of wheels and motor from diesel electric locomotive. Feb. 18, 1943, p. 148.



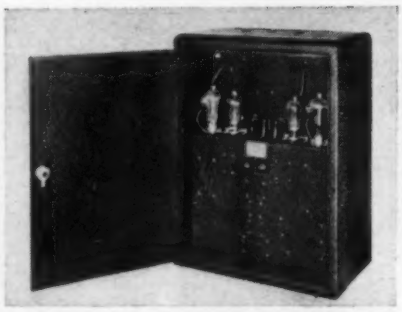
GEAR BOX—*Vard, Inc., 2961 E. Colorado Blvd., Pasadena 8, Calif.* Among the industrial uses for this lightweight gear box is as a drive for two units from a single motor. Dec. 23, 1943, p. 134.



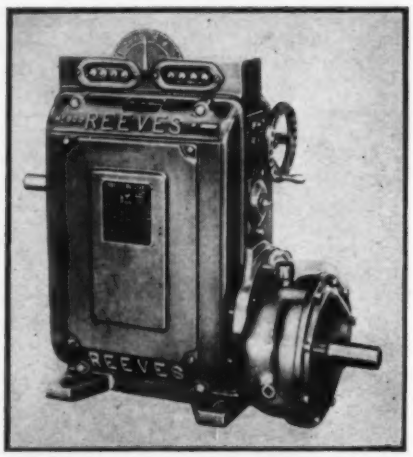
TRANSMISSION—*Western Mfg. Co., 3400 Scotten Ave., Detroit, Mich.* Left-hand output models of the Master and Major transmissions are now available. Aug. 19, 1943, p. 142.



VARIABLE SPEED DRIVE—*Graham Transmissions, Inc., 2706 N. Teutonia Ave., Milwaukee 6, Wis.* The unit is suited for application to motors of not more than 1/15 hp. Aug. 5, 1943, p. 134.



ELECTRONIC DRIVE—*Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.* The Mot-O-Trol adjustable-speed drive is suited for application on industrial drives and provides regulation over a 20:1 speed range from a.c. source. Apr. 29, 1943, p. 124.



TRANSMISSION—*Reeves Pulley Co., Columbus, Ind.* Horizontal and vertical designs are available in this unit with built-in speed reducer. Apr. 1, 1943, p. 113.

WORM GEAR—*De Laval Steam Turbine Co., Trenton, N. J.* This is a small unit with casing cast in one piece. Gears have ratios from 3⅝ to 1 up to 60 to 1. Mar. 18, 1943, p. 134.

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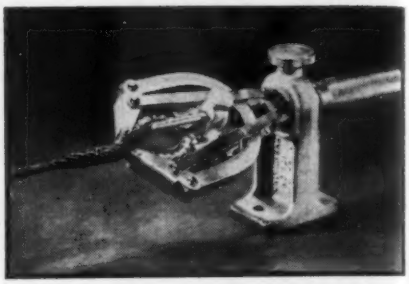
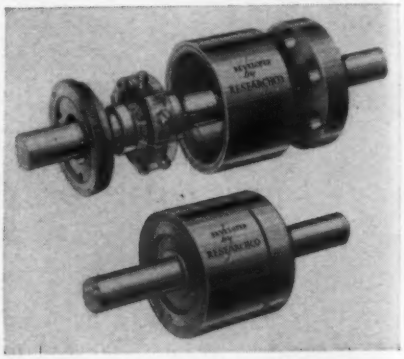
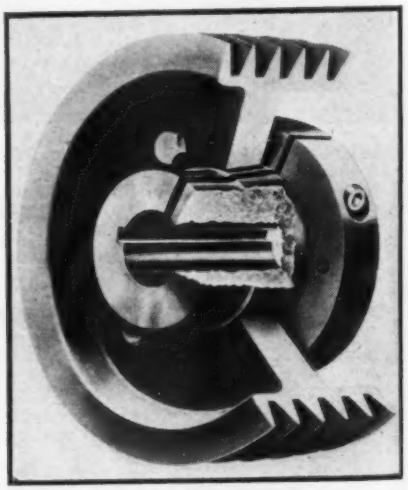
COUPLING—*American Screw Products, 7000 Avalon Blvd., Los Angeles 3, Calif.* This disconnecting self-sealing coupling is capable of withstanding 2,500 lb. per sq. in. Dec. 23, 1943, p. 134.



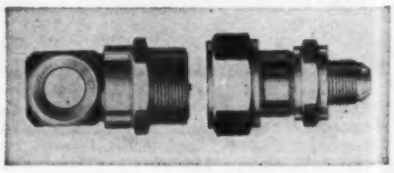
CABLE SPLICER—*Mechanics Engineering Co., Jackson, Mich.* The improved design of the Universal No. 101 requires no adapters. Oct. 14, 1943, p. 158.

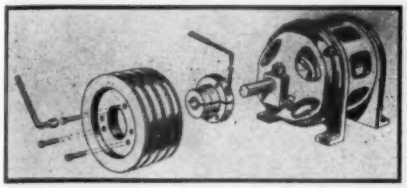


CLUTCH—*Amalgamated Engineering & Research Corp., 100 W. Monroe St., Chicago 3, Ill.* The Torkontrol unit serves as a coupling between shafts or as a driving pulley as well as a starting cushion. Dec. 9, 1943, p. 128.

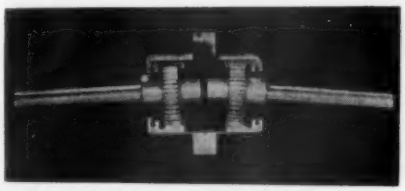


SHEAVE—*Worthington Pump & Machinery Corp., Harrison, N. J.* The QD (quick detachable) V-belt drive sheave is manufactured in standardized dimensions with maximum of ten grooves available. Sept. 16, 1943, p. 126.

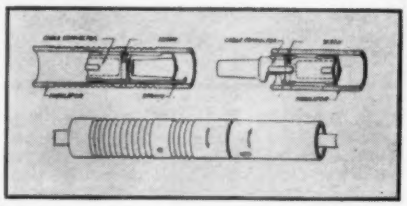




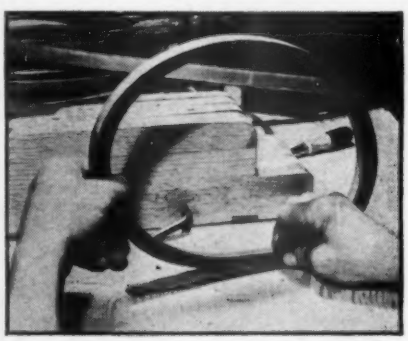
DRIVE SHEAVE—*Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago, Ill.* Standard QD sizes for multiple V-belt drives are available in this unit which is made for easy mounting. Aug. 5, 1943, p. 134.



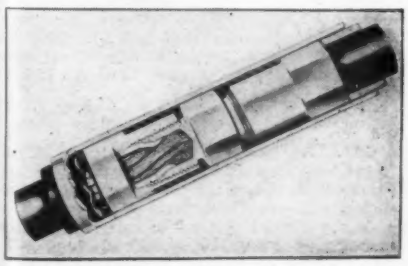
COUPLINGS—*Barcus Engineering Co., 3931-35 Falls Road, Baltimore, Md.* This is a gear type coupling for shafts in misalignment up to 6 deg. which operate in many combinations. Mar. 4, 1943, p. 136.



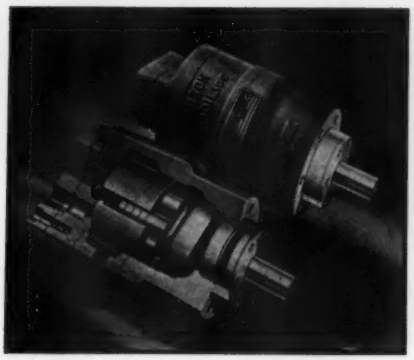
CABLE CONNECTOR — *Jackson Products, 3265 Wight St., Detroit, Mich.* The Quik-Trik has been developed for arc welding. July 22, 1943, p. 142.



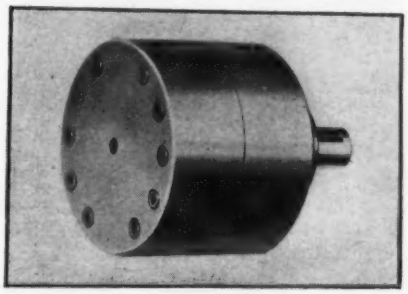
V-BELT—*Chas. A. Schieren Co., 29 Ferry St., New York, N. Y.* This V-belt built with flat leather side walls is furnished in rolls. July 8, 1943, p. 138.



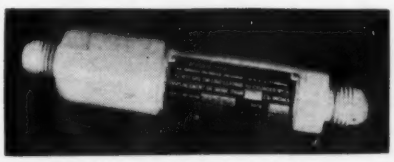
CABLE CONNECTOR AND LUG — *National Cylinder Gas Co., 207 W. Wacker Drive, Chicago, Ill.* This Cable-Tite solderless connector and lug is used for welding cables. Cable lengths may be connected or disconnected by hand. Feb. 4, 1943, p. 116.



MOTOR — *Denison Engineering Co., Columbus 16, Ohio.* This Hydroilic fluid motor features a floating drive and is adaptable to horizontal, vertical and angular mountings. Sept. 30, 1943, p. 118.



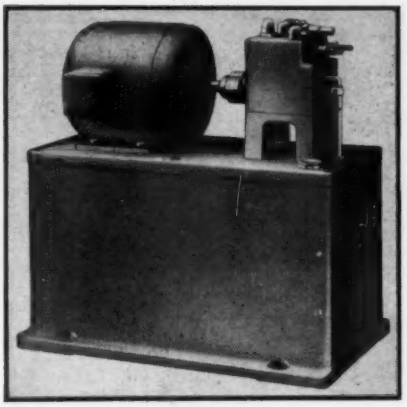
PUMPS—*Hydro-Motive Div., 723 E. Milwaukee Ave., Detroit, Mich.* Three sizes of this dual vane unit for high-pressure operation are available. Apr. 15, 1943, p. 142.



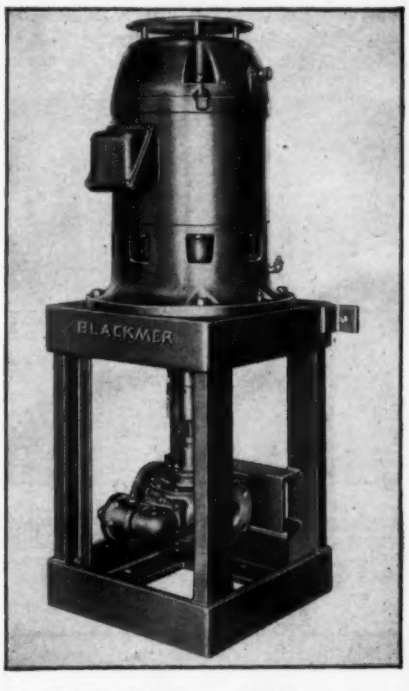
FUSE—*Simmonds Aerocessories, Inc., 10 Rockefeller Plaza, New York, N. Y.* This is a measuring type fuse for installation in aircraft hydraulic systems to act as an automatic safety shut-off. Dec. 9, 1943, p. 128.

TUBING CONNECTOR—*Grinnell Co., Inc., Superseal Div., Providence, R. I.* For use on oil, gas, air, chemical and other lines; made in sizes up to ½ in. outside diameter in steel, ⅝ in. and larger in malleable iron. Not shown. May 27, 1943, p. 148.

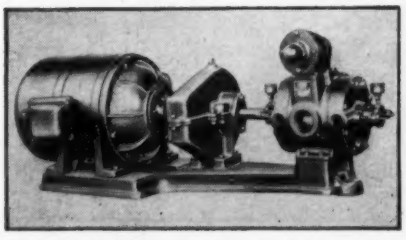
V-BELTS—*B. F. Goodrich Co., Akron, Ohio.* Wire-reinforced V-belts are available with cable cord construction, another type has a grommet construction with wire cord in the center of a cotton or rayon grommet. Not shown. May 13, 1943, p. 151.



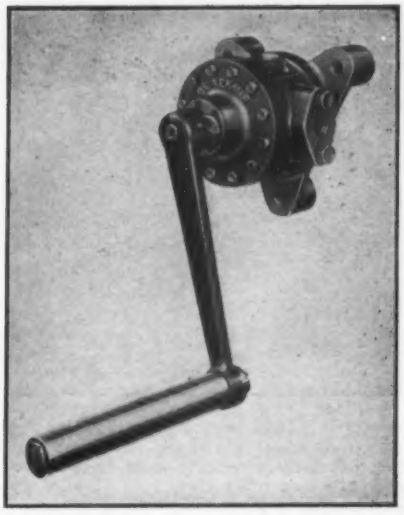
PUMP—*Anker-Holth Mfg. Co., 332 S. Michigan Ave., Chicago, Ill.* High and low pressure is provided in this supercharged combination oil hydraulic power unit. Sept. 13, 1943, p. 134.



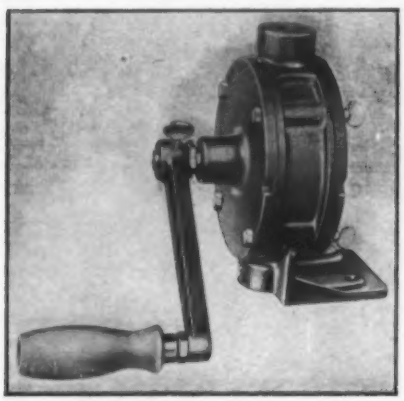
ROTARY PUMP — *Blackmer Pump Co., Grand Rapids, Mich.* It is vertically mounted and powered by 15 hp. gear head motor and is used for transfer of oils and other non-abrasive liquids. Feb. 4, 1943, p. 113.



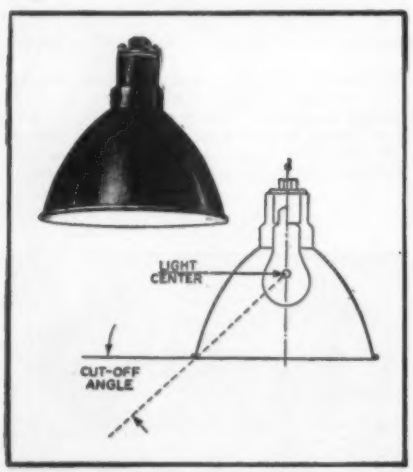
PUMP—*Blackmer Pump Co., Grand Rapids, Mich.* This steam-jacketed unit handles such materials as greases, palm oil and similar liquids which must be processed or transferred while hot. Jan. 1, 1943, p. 120.



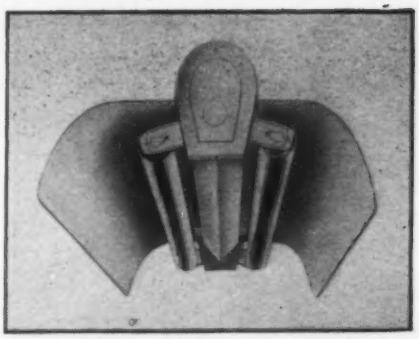
ROTARY PUMP — *Blackmer Pump Co., Grand Rapids 9, Mich.* This Dead Ship starting hand pump has industrial applications in connection with hydraulic control devices. Oct. 28, 1943, p. 130.



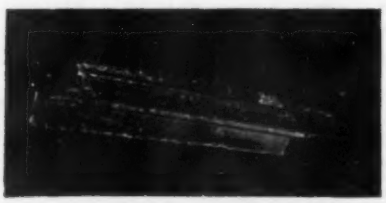
ROTARY PUMP — *Blackmer Pump Co., Grand Rapids, Mich.* Basic design of this hand pump follows the sliding vane principle. Apr. 15, 1943, p. 142.



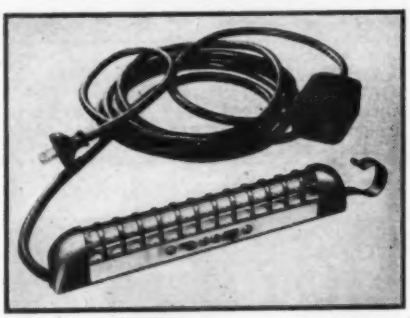
REFLECTOR—*Steber Mfg. Co., 2451 N. Sacramento Ave., Chicago, Ill.* Deep bowl reflector, made in four diameter sizes, confines and directs light rays directly on the work. Aug. 19, 1943, p. 140.



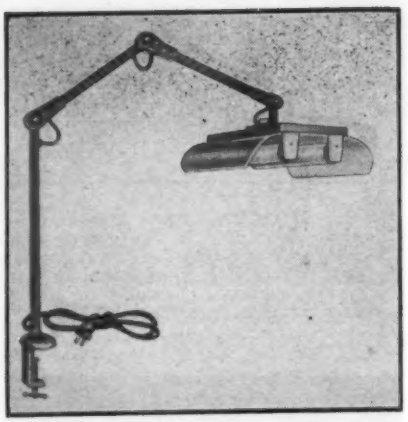
FLUORESCENT UNIT — *Fostoria Pressed Steel Corp., Fostoria, Ohio.* Instantaneous starting is provided in the Model MF-240-N unit by elimination of starting switches. Nov. 11, 1943, p. 134.



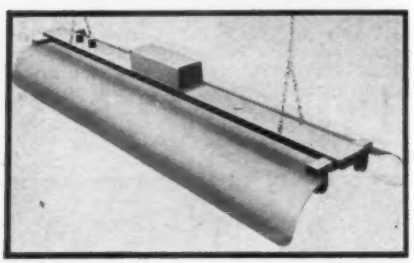
FLUORESCENT UNIT — *Edwin F. Guth Co., 2615 Washington Ave., St. Louis, Mo.* This Super-Illuminator unit with one-piece channel is available in sizes for two 40-, three 40-, and two 100-watt lamps. Oct. 28, 1943, p. 124.



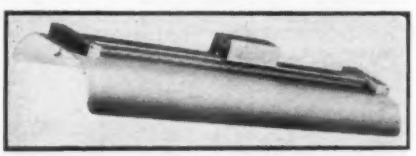
FLUORESCENT UNIT — *Sylvania Electric Products Inc., Fixture Div., Ipswich, Mass.* Improvements in the design of this P-7 extension cord unit include rounded ends and hanging hook riveted to the end cap. The unit operates on 110 to 125 volts, 60 cycle a.c. Oct. 14, 1943, p. 150.



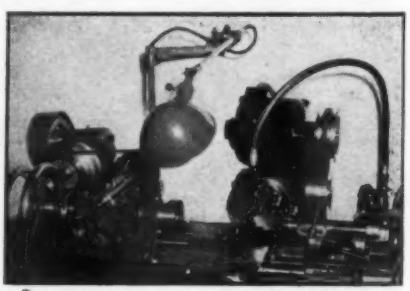
LIGHTING FIXTURE — *Fostoria Pressed Steel Corp., Fostoria, Ohio.* This fluorescent fixture has a flexible arm and accommodates two 14 watt lamps. Aug. 19, 1943, p. 140.



FLUORESCENT UNIT — *Martin-Gibson Co., 999 Harper Ave., Detroit, Mich.* The 5000 line of fixtures feature the Flexi-Coupler which permits spacing of fixture units. July 8, 1943, p. 148.

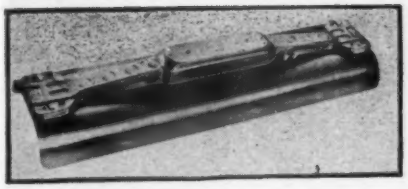


FLUORESCENT LIGHT—*Miller Co., Meriden, Conn.* A safety lamp lock forms an integral part of each socket in this lighting system. Sept. 2, 1943, p. 134.

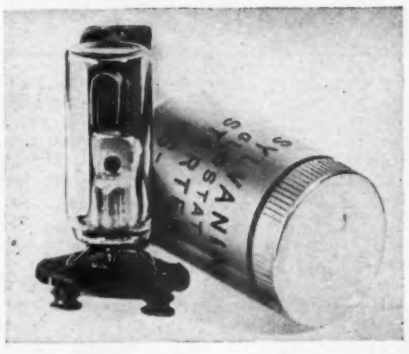


LAMP FIXTURE—*Waltham Machine Works, Waltham, Mass.* This unit is adjustable and made to fit Waltham thread miller. Sept. 16, 1943, p. 134.

LIGHTING FIXTURE—*Diehl Mfg. Co., Electrical Div. of Singer Mfg. Co., Somerville, N. J.* The Diehl-Lite for inspection, assembly and sorting operations equipped with 6-8 volt lamp, has blue-tinted lens. Nov. 25, 1943, p. 128.

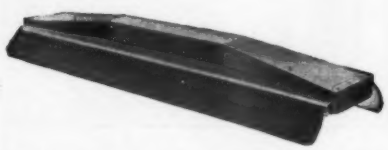


FLUORESCENT FIXTURES—*Sylvania Electric Products Co., Inc., Fluorescent Fixture Div., Ipswich, Mass.* Three models are available, one using two 40 watt lamps, another three 40 watt and another using two 100 watt lamps. July 8, 1943, p. 136.

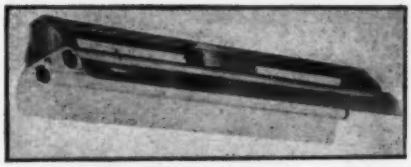


FLUORESCENT STARTER—*Sylvania Electric Products, Inc., Lighting Div., Salem, Mass.* The Glostat lamp starter is available for 15 and 20 watt lamps, and another for 30 and 40 watt lamps. June 24, 1943, p. 130.

FLOODLIGHT—*Steber Mfg. Co., 2451 N. Sacramento Ave., Chicago, Ill.* The Circulite unit is adjustable at any angle and takes 300 or 500 watt lamps. June 24, 1943, p. 134.

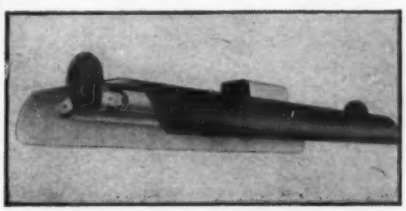


FLUORESCENT FIXTURE — *Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.* The Quick-Liter uses a super-ballast with circuit that starts lamps without starter switches. Nov. 11, 1943, p. 126.

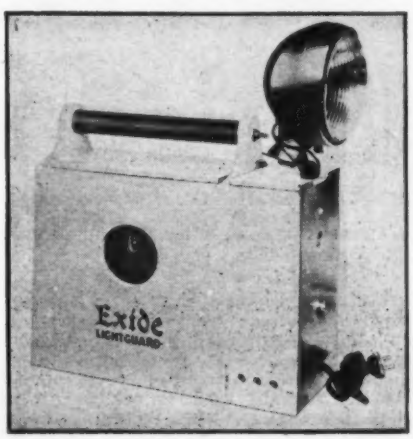


FLUORESCENT FIXTURE—*Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago, Ill.* Units available include two-light units, three-light units using 40-watt lamps, two-light units using 100-watt lamps, and two-section units for four 100-watt lamps. May 27, 1943, p. 146.

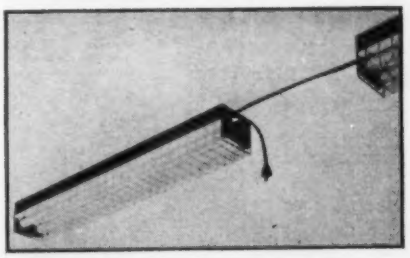
LIGHT—*Reliance Devices Co., 510 Sixth Ave., New York, N. Y.* The Swivelier is suited for attachment to machines, walls, ceilings or work bench. Socket adjusts to 90 deg. vertical range. May 13, 1943, p. 146.



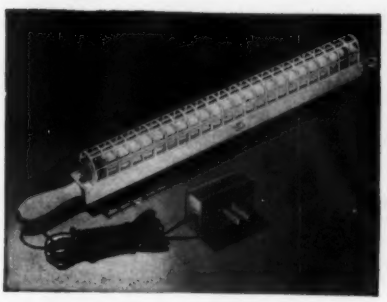
FLUORESCENT UNIT — *Fostoria Pressed Steel Corp., Fostoria, Ohio.* The Generalite unit has non-metallic reflectors in the V-shaped wiring channel. May 13, 1943, p. 136.



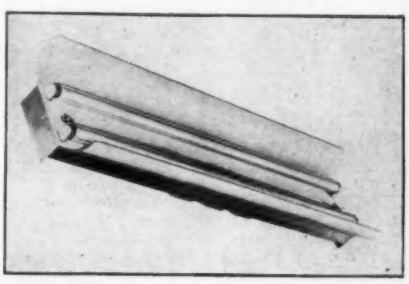
FLUORESCENT BALLAST—*General Electric Co., Schenectady, N. Y.* This is a three-lamp 40 watt high power factor unit for fluorescent lighting. Apr. 29, 1943, p. 126.



LIGHTING UNIT—*Lumidor Mfg. Co., 3120 E. Pico Blvd., Los Angeles, Calif.* This is a double-circuit mechanic's light equipped with receptacle for plugging in small power tools and additional fixtures. Mar. 18, 1943, p. 136.

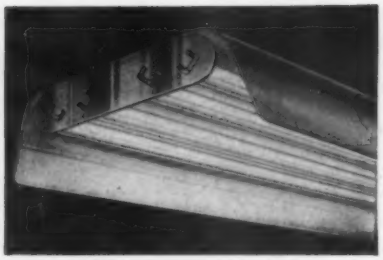


FLUORESCENT LAMP — *Edwin F. Guth Co., 2615 Washington Ave., St. Louis, Mo.* Extensolite is a portable unit useful in assembly and inspection of plane engines. Apr. 1, 1943, p. 124.



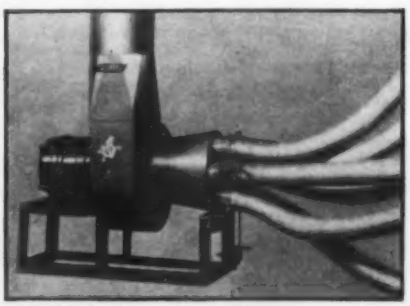
FLUORESCENT UNIT—*Spero Electric Corp., 18220 Lanken Ave., Cleveland, Ohio.* The Insta-Lite fixture provides illumination to full intensity as soon as turned on; unit is made for two 40 watt tubes, 110 to 125 volts a.c. Feb. 18, 1943, p. 150.

LIGHTING UNIT—*Electric Storage Battery Co., 19 St. and Allegheny Ave., Philadelphia, Pa.* The Exide Lightguard is designed for emergency lighting at control equipment. Apr. 29, 1943, p. 132.

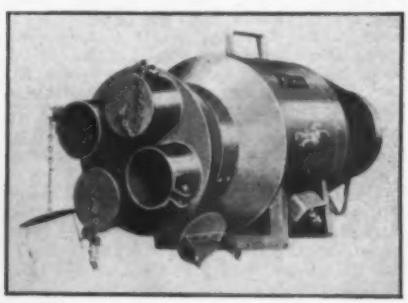


REFLECTOR—*Edwin F. Guth Co., 2603 Washington Ave., St. Louis, Mo.* Super-Maze-Lite reflectors are made of wood and equipped with Forlamp ballast for 265 volts. Feb. 4, 1943, p. 128.

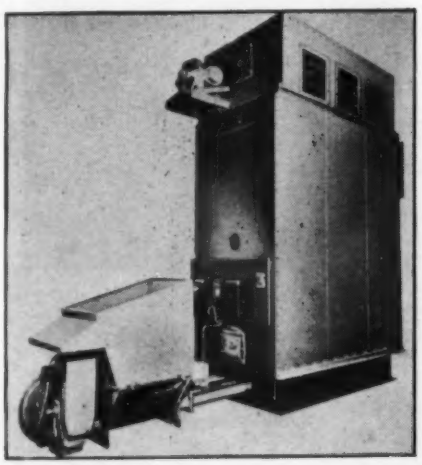
FLOODLIGHT — *Benjamin Electric Mfg. Co., Des Plaines, Ill.* This floodlight projector serves for protective lighting of yards and outdoor work places. Apr. 1, 1943, p. 124.



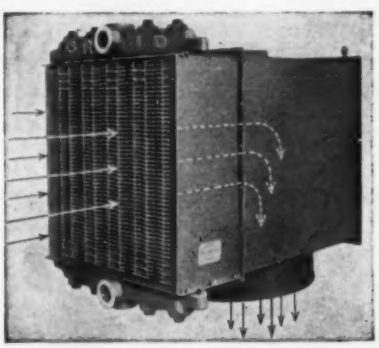
FUME EXHAUSTER—*Chelsea Fan & Blower Co., 1206 Grove St., Irvington, N. J.* Adapters are interchangeable and can be used for suction or blowing as required. May 13, 1943, p. 148.



ELECTRIC HEATER—*General Electric Co., Schenectady, N. Y.* This 230 volt a.c. forced-convection unit for use in shipyards, crane cabs, and other out-of-the-way places is adapted to floor or wall use. Mar. 4, 1943, p. 134.

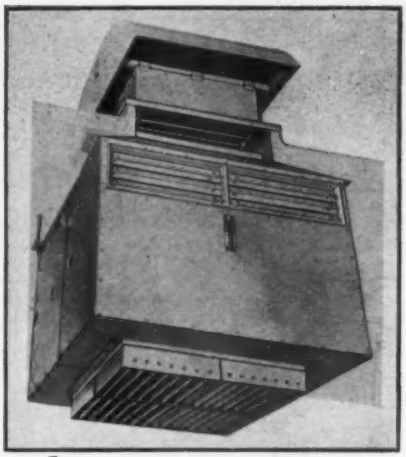


HEATER—*Dravo Corp., Pittsburgh, Pa.* This self-contained unit in sizes from 1 to 4 million B.t.u. per hr. underfeed stoker for either bituminous or anthracite fuel. Mar. 4, 1943, p. 130.

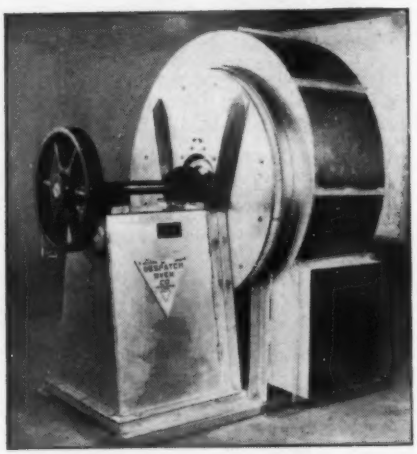


UNIT HEATER—*D. J. Murray Mfg. Co., Wausau, Wis.* The grid heater features the down-blow principle. Mar. 18, 1943, p. 138.

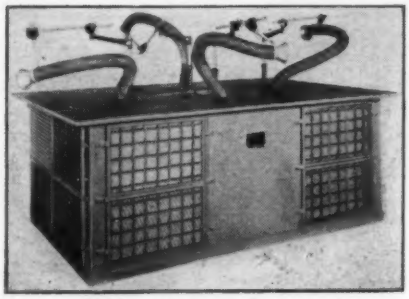
BLOWER—*Chelsea Fan & Blower Co., Inc., 1206 Grove St., Irvington, N. J.* The Octopus Jr. exhauster and blower is a small portable unit for eliminating gases and fumes from closed-in places at the rate of 2,000 cu. ft. per min. Feb. 18, 1943, p. 150.



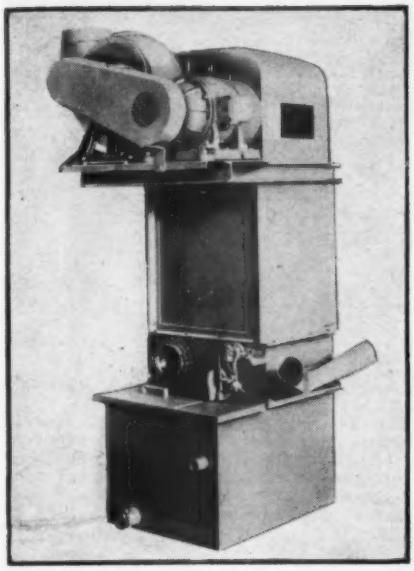
VENTILATOR—*Young Radiator Co., Racine, Wis.* The Vertivent heater and ventilator for plant roofs offers controlled ventilation and air tempering. Range of capacities are 5,000, 10,000 and 15,000 cu. ft. per min. May 13, 1943, p. 144.



FAN—*Despatch Oven Co., 622 Ninth St., S. E., Minneapolis, Minn.* This is a centrifugal type fan for use in recirculating furnaces with temperatures up to 1,600 F. requiring high velocity and high volume airflow. May 13, 1943, p. 136.

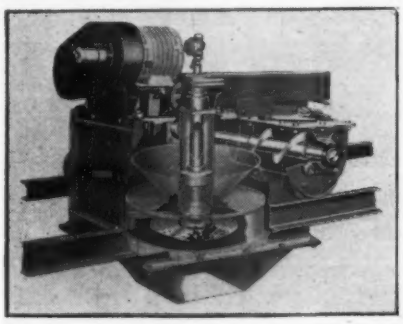


GRINDING BENCH—*Schmieg Industries, 324 Piquette Ave., Detroit, Mich.* This equipment is suited for use with portable grinders. It is four-station with integral dust collector. June 10, 1943, p. 130.



DUST COLLECTOR — *Industrial Equipment Corp., 6435 Hamilton, Detroit, Mich.* This is a small-sized unit with a capacity of 1,200 cu. ft. per min., for double-spindle grinding and buffing lathes. July 22, 1943, p. 134.

DUST COLLECTOR — *Aget-Detroit Mfg. Co., 2040 Book Bldg., Detroit, Mich.* Capacity of the self-contained Model 1250 Dustkop unit for buffers, polishers and grinders is 1,250 cu. ft. per min. Jan. 7, 1943, p. 116.



DUST COLLECTOR BENCH—*American Air Filter Co., Dust Control Div., Louisville, Ky.* For safety in burring, filing and flexible shaft grinding of magnesium, this unit provides a semi-inclosed bench assembly with down-draft ventilation. Capacities from 1,000 to 20,000 cu. ft. per min. are available. June 10, 1943, p. 134.

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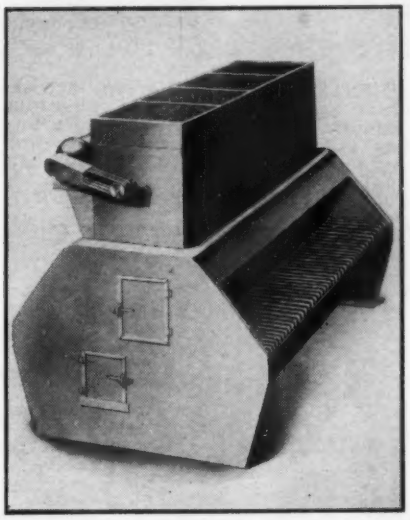
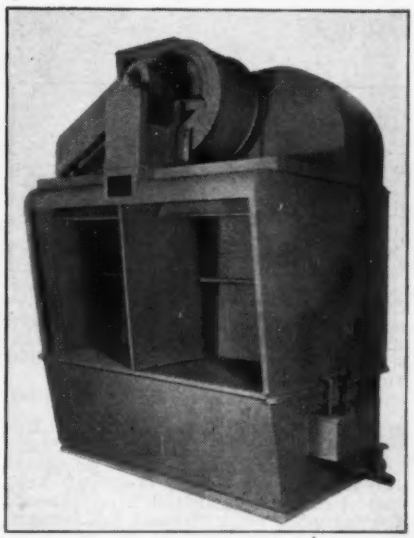


MULTI-WASH BENCH — *Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.* This bench is suited for removing grinding and cleaning dust from bench operations, working surface is 10 ft. long, 30 in. wide. July 22, 1943, p. 140.



DUST COLLECTOR — *Industrial Equipment Corp., Detroit, Mich.* This equipment is suited for processing of magnesium and is available in booth type or individual collectors for grinding stands. Dust is drawn through a water spray. May 27, 1943, p. 142.

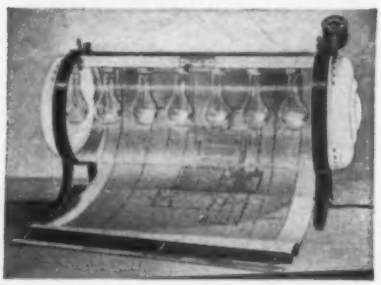
←

SCREW CONVEYOR FEED—*American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind.* This feed has been added to the company's wet disposal units to provide constant, uniform rate of feed of discharge dust from dry type collectors. Feb. 4, 1943, p. 128.

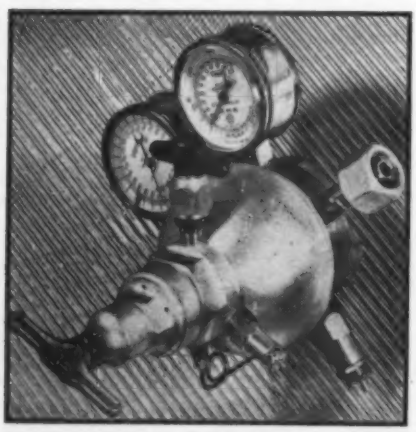
DUST COLLECTOR — *Bargar Sheet Metal Co., Cleveland, Ohio.* This portable Safe-Aire unit will supplement larger, permanent dust control systems or will replace them. Capacity is 600 cu. ft. per min. May 27, 1943, p. 148.

DUST COLLECTOR—*Aget-Detroit Co., 2040 Book Bldg., Detroit, Mich.* The portable Dustkop unit for collecting dust and dirt from tool, cutter and similar grinding operations is built for operation on 25 or 60 cycle a.c. Mar. 4, 1943, p. 132.

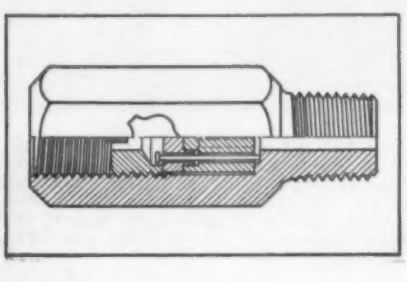
PROTRACTOR—*Industrial Engineering Co., 141 West Jackson Blvd., Chicago 4, Ill.* The Xactor is available in an improved pocket size lock type for measuring angles of drill points, for sketching and laying out tools. Dec. 9, 1943, p. 120.

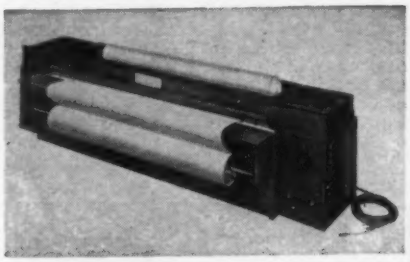


PRINTING MACHINE — *Victoray Products Co., 123 N. Wacker Drive, Chicago, Ill.* Blueprints, black and white prints, or photo copies up to 24x36 in. can be made with this printing and copying machine. Oct. 14, 1943, p. 152.



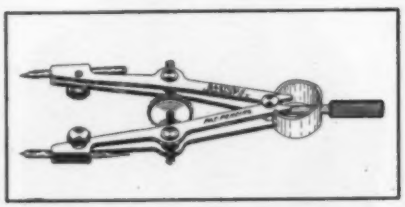
REGULATOR—*Victor Equipment Co., 844-854 Folsom St., San Francisco 7, Calif.* The pilot type pressure regulator is suited for refilling cylinders from cylinder manifold systems; available for inlet pressures up to and exceeding 4,000 lb. per sq. in., and delivery pressures up to 1,000 lb. per sq. in. Nov. 11, 1943, p. 128.





PRINTERS—*Peck & Harvey, 4327 Addison St., Chicago, Ill.* Two table type printers are available for blueprints and black and white prints which produce prints up to 44 in. wide. Dec. 9, 1943, p. 126.

PHOTOCOPY MACHINE — *American Photocopy Equipment Co., 2849 North Clark St., Chicago, Ill.* Exact photo copy of blueprints, written or printed material, photographed material, can be produced of copy up to 18x22 in. May 18, 1943, p. 144.



COMPASS—*A. P. Bartusch, 775 Walnut St., Lockport, N. Y.* This 3-in. bow compass and divider has four-leg construction and center wheel adjustment. June 10, 1943, p. 138.

SLIDE CHART—*Elemoto Sales Co., P. O. Box 62, Teaneck, N. J.* Many standard measurements, such as coarse and fine thread series, Woodruff keys and American standard pipe threads are included on a revised slide chart. Not shown. Oct. 28, 1943, p. 128.

CALCULATOR—*W. O. Barnes, 1297 Terminal Ave., Detroit 14, Mich.* Cutting time for steel with power hacksaws is shown on a calculator developed by this company. The reverse side lists SAE, AISI, and AMS specifications of steel. Not shown. Nov. 25, 1943, p. 136.

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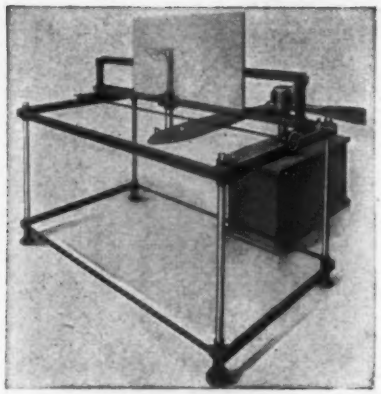
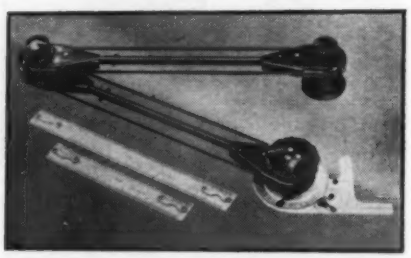
PULSATION DAMPENER—*Manning, Maxwell & Moore, Ashcroft Gauge Div., Elias St., Bridgeport, Conn.* For use with pressure gages subject to pulsations and rapid fluctuations, this unit is suited for any pressure medium. Nov. 11, 1943, p. 132.

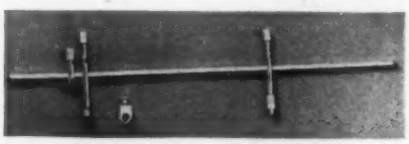


CONTOUR TRANSFER UNIT—*Inter-Lakes Engineering Co., 502 Transportation Bldg., Detroit 26, Mich.* The Dupligraph device transfers the exact contour of irregular surfaces on transparent paper or metal. Nov. 11, 1943, p. 138.

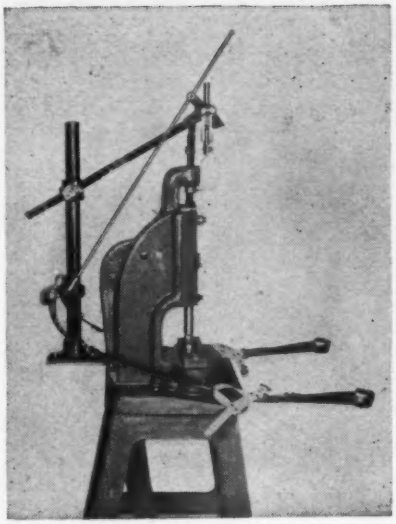
BLUEPRINTER — *Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y.* Blueprints, direct process prints and sepia negatives up to 54 in. wide can be exposed in the 8Q printer, suited for 220 volts a.c. Oct. 14, 1943, p. 158.



DRAFTING DEVICE—*V & E Mfg. Co., Pasadena, Calif.* The Vemco Junior is made of plastic, and has a full circle base-line setting. Sept. 2, 1943, p. 125.



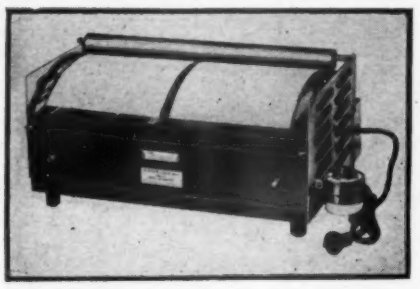
COMPASS—*Mark Specialty Co., 406 Temple Bldg., Rochester 4, N. Y.* This compass features a micrometer adjustment at the pivot point to set measurements to 0.001 in.; supplied with bar, 18, 24, 36 in. or longer. Sept. 16, 1943, p. 140.



KICK PRESS DEVICE—*Positive Safety Manufacturing Co., 4410 Perkins Ave., Cleveland 3, Ohio.* This unit mounts on a bench or standard and provides a safety device for the operator of a kick press. Dec. 23, 1943, p. 136.

GOGGLE CREAM—*Carhoff Co., 3050 Kensington Rd., Cleveland, Ohio.* No-Fog has been developed to prevent fogging when applied to eyeglasses, goggles, also used for polishing photographic lens. Not shown. Apr. 29, 1943, p. 135.

WELDING SUITS—*American Optical Co., Safety Div., 70 W. 40 St., New York, N. Y.* This is a tailored leather suit and hat for women workers which provides protection not given by ordinary clothing. Not shown. Nov. 25, 1943, p. 138.



PRINTER—*Peck and Harvey, 4325 Addison St., Chicago, Ill.* This portable table model Spee-Dee printer is suited for making blue prints or black and white prints. Apr. 29, 1943, p. 132.

COMPASS—*Ithaca Scientific Instrument Co., Ithaca, N. Y.* The toolmaker's compass scribes and draws small circles a few thousandths to ⅝ in. radius. Not shown. Jan. 7, 1943, p. 124.

ENGINEER'S GLASS—*Industrial Engineer's Specialties Div., Universal Engraving & Colorplate Co., 1919 E. 19 St., Cleveland, Ohio.* Translucent and transparent forms of engineer's-glass are used for drawing diagrams. Engineer's-transparency is available in ground or clear glass. Both serve for drawing diagrams in pencil, prior to inking in for preparation of reproduction. Not shown. Mar. 18, 1943, p. 140.

FIRE EXTINGUISHER — *Randolph Laboratories, Inc., 8 E. Kinzie St., Chicago, Ill.* Model FF-4 is a 4 lb. carbon dioxide unit which operates by thumb pressure. Dec. 9, 1943, p. 130.

SHIELD — *Emergency Equipment Corp., 55 Halleck St., Newark, N. J.* The Huntsman acetylene and arc welding shield is equipped with a safe locking device to hold the shield in position. Sept. 2, 1943, p. 138.

SAFETY MAT—*Industrial Products Co., 2820 N. Fourth St., Philadelphia, Pa.* Tuf-Link safety mats have scrap-rubber composition links held in place with wire rods. Four sizes available. Not shown. June 10, 1943, p. 140.

SAF-T-BRA—*Willson Products, Inc., Reading, Pa.* The device is made of plastic and provides protection for breasts of women workers. Not shown. Nov. 11, 1943, p. 132.

SAFETY GOGGLES—*American Optical Co., Southbridge, Mass.* The Ful-Vue goggle is made in 42 mm. eye size for women workers. Not shown. July 8, 1943, p. 144.

SAFETY GOGGLES — *Watchemoket Optical Co., Providence, R. I.* Eye Savers safety goggles are equipped with Plexiglas lenses, removable for cleaning. July 22, 1943, p. 132.

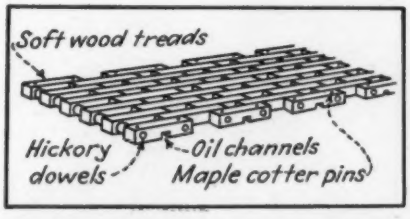
SAFETY GOGGLE—*DuBois Plastics, Detroit, Mich. American Allsafe Co., Buffalo, N. Y.,* distributes plastic goggles which fit over eye glasses. Not shown. Apr. 15, 1943, p. 144.

PROTECTIVE GARMENTS — *West Disinfecting Co., 42-16 West St., Long Island City, N. Y.* Durma-Gard garments for men and women are made of plasticized material, and are provided in sleeves, aprons, overalls, and coveralls. Not shown. Apr. 29, 1943, p. 134.

EYE SHIELD — *Standard Safety Equipment Co., 232 W. Ontario St., Chicago, Ill.* The No. 9 Stasafe eye shield is suited for women workers; equipped with head shield for protection of hair. Not shown. Apr. 1, 1943, p. 128.

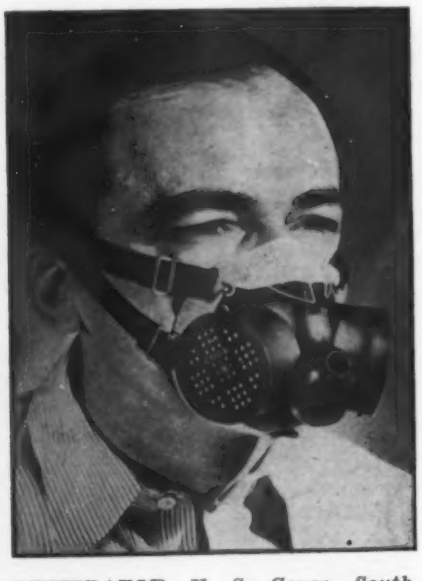
EYE-PROTECTION GLASS — *American Optical Co., Southbridge, Mass.* Didymium-Noviweld glass for lenses in welding goggles is available in three shades of lenses. Not shown. Apr. 15, 1943, p. 144.

HAIRGARD—*Standard Safety Equipment Co., 232 W. Ontario St., Chicago, Ill.* An adjustable model has been developed for the protection of women workers' hair. Available in four styles. Not shown. Apr. 15, 1943, p. 140.



SAFETY MAT—*Ton-Tex Corp., 247 Pearl St., N.W., Grand Rapids, Mich.* All-wood mat for protection of workers' feet from cold, damp, oily or rough floors, can be furnished in any desired length and width not over 3 ft. June 10, 1943, p. 134.

RESPIRATOR—*American Optical Co., Southbridge, Mass.* An air-filtering cartridge has been developed for its R-1000 respirator. Apr. 15, 1943, p. 138.



RESPIRATOR—*H. S. Cover, South Bend, Ind.* The Dupor No. 10 chemical cartridge respirator is equipped with cartridges made of colored plastics. Mar. 18, 1943, p. 138.

GAUNTLET—*Industrial Gloves Co., Danville, Ill.* Steel-Grip gloves are available for women workers in gauntlet style with steel ribbon reinforcement. Apr. 1, 1943, p. 142.

PUMP TANK — *American-LaFrance-Foamite Corp., Elmira, N. Y.* This unit is designed for controlling magnesium type incendiary; constant stream has a range of 30 to 40 ft. Mar. 4, 1943, p. 132.

GLOVES — *Edmont Mfg. Co., 575 Orange St., Coshocton, Ohio.* Industrial gloves for women workers are made to protect hands against solvents, acids, caustics and other corrosive material. Not shown. Feb. 4, 1943, p. 128.

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RESPIRATOR—*Mine Safety Appliance Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.* The Clear-Vue Dustfoe respirator is available in an all-plastic model. Mar. 18, 1943, p. 136.

EXTRACTORS — *Reps Tool Co., 99 Wall St., New York, N. Y.* Stub ends of pipes, nipples, tubes, bolts or screws can be removed with this unit, available in ten sizes. July 8, 1943, p. 142.

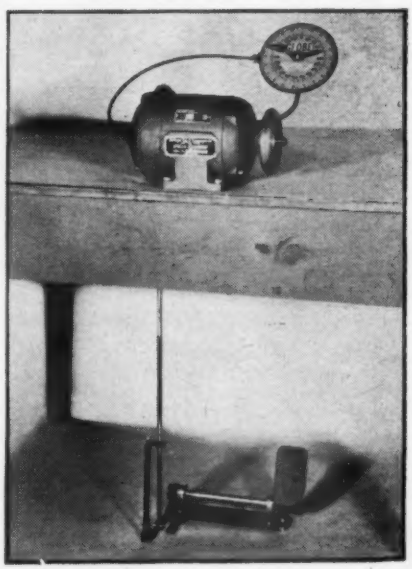
VIBRATION CHECKER — *Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.* The automatic watchman measures vibration in spinning shafts of turbo-generators in thousandths of an inch. Feb. 18, 1943, p. 146.

PROTECTIVE CLOTHING — *Milburn Co., 905 Henry St., Detroit, Mich.* Ply Garb clothing offered by this company is made of featherweight, plastic-laminated cotton cloth and is flameproof. Not shown. Apr. 1, 1943, p. 128.

SAFETY SHOE—*F. J. Stahmer Shoe Co., Davenport, Iowa.* It is made for women workers; has soles made from maple; seams are water tight. Feb. 18, p. 150.

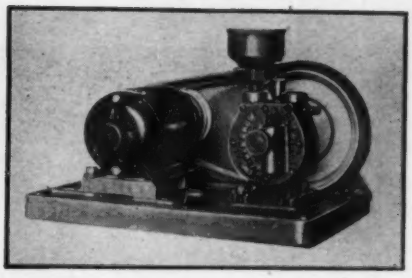
INDICATOR—*General Electric Co., Schenectady, N. Y.* This vibration displacement indicator checks commutator roundness in motors running at high speed. Sept. 2, 1943, p. 138.

NYLON ROPE—*E. I. du Pont de Nemours & Co., Wilmington, Del.* This rope measures about ½ in. in diameter, is said to be about twice as strong as manila rope of the same thickness, and lifts a load of 3 tons. Not shown. Dec. 9, 1943, p. 128.

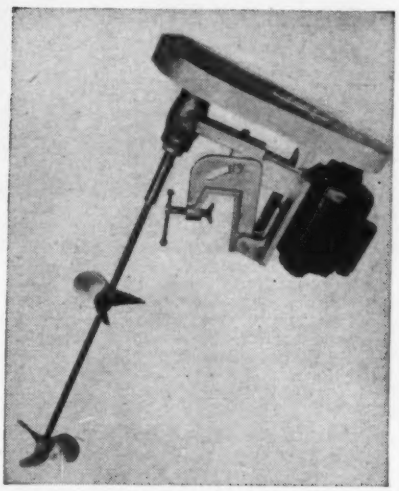


COIL WINDER—*Globe Tool & Engineering Co., 436 Davis Ave., Dayton, Ohio.* This A.C. winder has speed range from minimum of 10 to maximum of over 4,000 r.p.m. in direct drive model. July 22, 1943, p. 138.

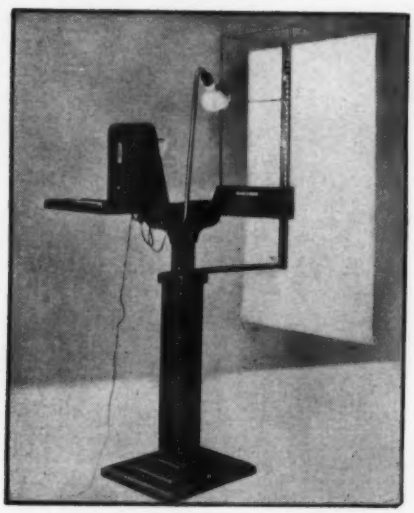
PACKING LIST PROTECTOR—*Philip Carey Mfg. Co., Cincinnati, Ohio.* Distributed by Western Paper Goods Co., Cincinnati, Ohio. An asphalt plyboard protector has been developed to take bulky packing lists, assembly instructions and the like. Not shown. Nov. 25, 1943, p. 136.



VACUUM MACHINE—*Leiman Bros., Inc., 136 Christie St., Newark, N. J.* This is an automatic outfit for steam heating systems made in several sizes; smallest suited for 4,500 sq. ft. of radiation. Feb. 4, 1943, p. 118.

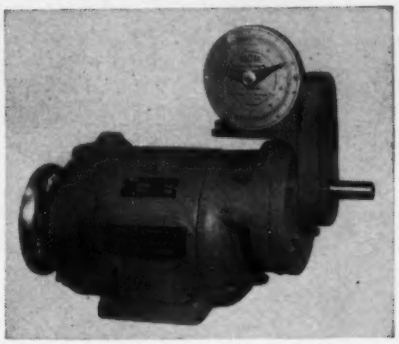


INDUSTRIAL MIXER—*United Electric Motor Co., 178 Centre St., New York, N. Y.* This portable unit is designed for low- or high-speed mixing. Nov. 25, 1943, p. 130.

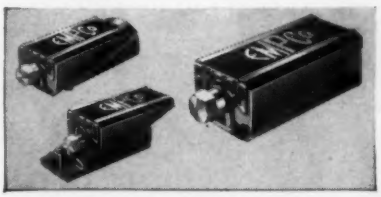


IDENTIFICATION EQUIPMENT — *Photographic Equipment, Inc., 210 E. Park Way, Pittsburgh, Pa.* This Model B WIM unit includes a white background, finger-printing equipment. Apr. 15, 1943, p. 144.

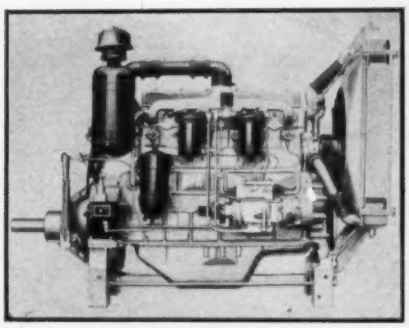
DRUM OPENER—*Merrill Brothers, 36 Caspian St., Maspeth, Brooklyn, N. Y.* This tool operates on the principle of a household can opener, cutting and folding the edges of the barrel back. Not shown. Dec. 23, 1943, p. 136.



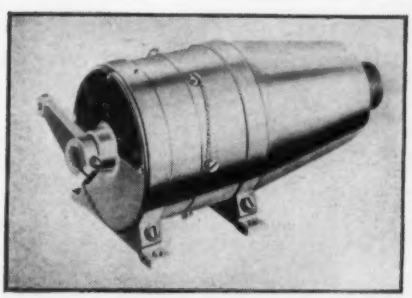
COIL WINDER—*Globe Tool & Engineering Co., 436 Davis Ave., Dayton, Ohio.* Wire sizes from No. 16 to No. 42 may be wound with this equipment into coils up to 5 or 6 in. in diameter. Nov. 25, 1943, p. 125.



LEVELING JACK — *Enterprise Machine Parts Corp., 2734 Jerome Ave., Detroit, Mich.*. This equipment for leveling machine tools, furnaces, large surface plates and assembly fixtures is offered in sizes ½, ⅞ and 1¼ in. adjustment capacity. June 10, 1943, p. 138.



DIESEL ENGINE—*Chrysler Corp., Detroit, Mich.* This is a six-cylinder industrial-type engine with a bore of 3¾ in. and stroke of 5 in.; brake horsepower is 80 at 2,000 r.p.m. Sept. 2, 1943, p. 132.



CONTROL MOTOR — *Barber-Colman Co., Rockford, Ill.* It is used for control of dampers, in governing cabin temperatures, flow of air through superchargings, airplane engine cowl flaps, as well as to drive valve mechanisms.

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Gives details of standard laboratory tests on new and used oils; the composition of greases; types of machine tools; machine tool lubrication and maintenance; the mechanics of metal cutting; the composition of cutting oils; compounds and blends of cutting oils; the practical application of cutting oils; tool design, machinability tables, and the treatment and prevention of skin diseases resulting from contact with compounded oils.

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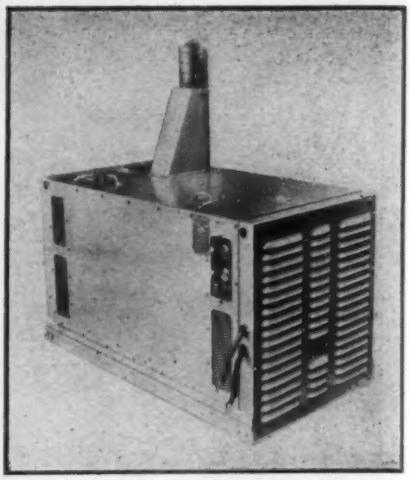
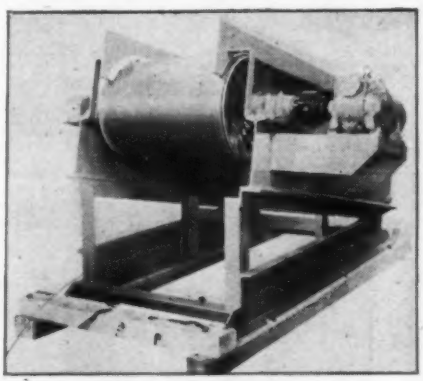
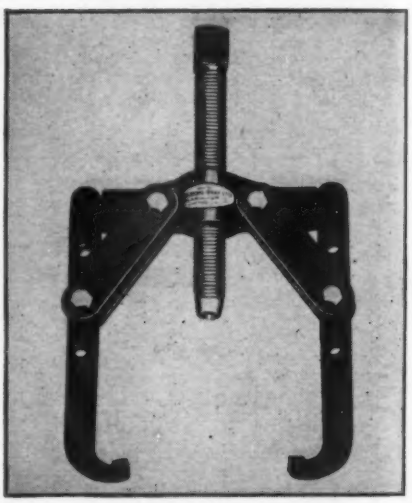
IDENTOMETER — *American Tubular Elevator Co., Instrument Div., Pittsburgh, Pa. Distributed by Dravo Corp., 300 Penn Ave., Pittsburgh, Pa.* This instrument registers alloy steel analysis according to heat, grades, types, heat-treatment and composite types. June 24, 1943, p. 136.



GAS-ELECTRIC UNIT—*Ready-Power Co., 3828 Grand River & Avery St., Detroit, Mich.* Model G is a heavy-duty unit. It is built for 10 to 30 ton electrical industrial trucks. Oct. 28, 1943, p. 134.



MAGNETIC SEPARATOR — *Dings Magnetic Separator Co., 509 E. Smith St., Milwaukee, Wis.* The machine incorporates a high intensity magnetic pulley of serrated air-cooled construction, and is used for reclamation of steel and iron. Feb. 18, 1943, p. 146.



GEAR AND WHEEL PULLER—*Armstrong-Bray & Co., 5361-78 Northwest Highway, Chicago, Ill.* Steelgrip rigid-arm gear and wheel puller is suitable for hooking over 6 and 8 in. wheels. Mar. 4, 1943, p. 122.

LOCKER AND SHELVING — *Ivel Corp., 211 W. 61 St., New York, N. Y.* These units are made of plywood and pressed wood, and finished in olive green enamel. Not shown. Feb. 4, 1943, p. 120.

IDENTIFICATION BADGE — *American Emblem Co., Hyde Parke Ave., Utica, N. Y.* A reusable and tamper-proof badge which is locked with a special tool is available from this company. Not shown. Apr. 1, 1943, p. 128.

TURNSTILE — *Perley Mfg. Co., Inc., 101 Park Ave., New York, N. Y.* The Super-Kompak turnstile is portable; available with foot pedal or token control; supplied for entrance and exit, or for one-way passage. Not shown. Jan. 7, 1943, p. 120.

SHEATHING—*Philip Carey Mfg. Co., Asbestos-Cement Products Dept., Lockland, Cincinnati, Ohio.* Careystone flat sheathing is suited for building lockers. Available in sheets 48x96 in. and ⅜ in. thick. Not shown. June 24, 1943, p. 140.

Cutting oil *News* letter

Practical suggestions from the field on how cutting oils and coolants are being used by midwest machine operators to lick tough wartime jobs.

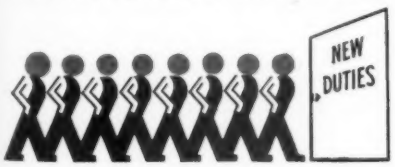
JANUARY, 1944

How longer tool life was obtained in making 250 lb. "practice" bombs

Operations by a stamping company on 250 lb. "practice type" bombs included drilling, reaming, tapping of the nose, cutting off tail end, and chasing an internal thread. Several oils failed to do the job right. Then the operator switched to Stanicool H. D. Soluble Oil (6 to 1 mixture); said it not only produced a better finish, but gave much longer tool life.

Bothered by Buildup on Dies? This was a real problem to a northwest manufacturer . . . on the male die on a deep draw job (6 in. deep) using 26 gauge steel sheets. Two parts Stanostamp "C" to one part water applied by swab ended this problem; also gave longer tool life at reduced cost.

Released 8 Men for Other Plant Work.



In producing 90 mm. anti-aircraft shells, a wrench manufacturer bumped into two headaches: (1) Use of high grade cutting oil at high surface speed and depth of cut caused excessive smoke, made parts too hot to handle. (2) Discoloration of the copper bands kept eight men busy buffing them. Working with plant operators, a Standard Lubrication Engineer selected a special soluble oil for this job. Last report was: perfect work coming through . . . no more rejects . . . the 8 men released for other work in the plant . . . ordnance inspectors enthusiastic.

Didn't ask for extra tool life but got it . . . as a bonus! The main idea in this plant was to lick the twin problems of 10% rejects and breaking along the edges when stamping radiator fins. Variation in hardness of material was the root of the trouble . . . which completely disappeared after changing over to Acme Base Oil Extra Heavy mixed 1 to 6 with paraffine oil. And to top it all off, a 40% increase in tool life has been secured.

How to Prevent Staining on Aluminum After Machining. Here's a practical suggestion that will interest many operators handling aluminum parts. In order to get away from staining and deposits on aluminum after machining, a battery and parts maker tried out a number of cutting oils. Final report is that Stanicut 62 FC was the only one to give full satisfaction. It is now standard for this operation.

OIL IS AMMUNITION . . . USE IT WISELY

World's Largest Planer Takes 6 Cuts At Once. A rolling mill and foundry company recently installed what was said to be the largest planer in the world. It has a table weighing 75 tons, carries a load of 300,000 lbs., takes six cuts at one time. Six barrels of Stanolex No. 31 were placed in the system for dependable lubrication.

Army Inspectors Give Entire Approval. A farm machinery manufacturer, in recently converting to war production, found it difficult to secure approval of finish and cleanliness of parts for plating after machining and tapping SAE 4150 steel. They started using Premier Cutting Oil No. 110 about 5 months ago, and army inspectors have given entire approval on workmanship ever since. More ease in cleaning parts for plating with this oil was a plus advantage.

When You Bump Up Against Special Cutting Oil Problems

• If you are running into trouble in handling war work, and find it tough to get the necessary accuracy, finish, and tool life on converted machines . . . or if you have other perplexing machining jobs that a more efficient application of cutting oils may help answer . . . call in a Standard cutting oil specialist. Phone or write Standard Oil Company (Indiana) office, or 910 S. Michigan Ave., Chicago, Ill., for the Engineer nearest you. In Nebraska, contact any Standard Oil Company of Nebraska office.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

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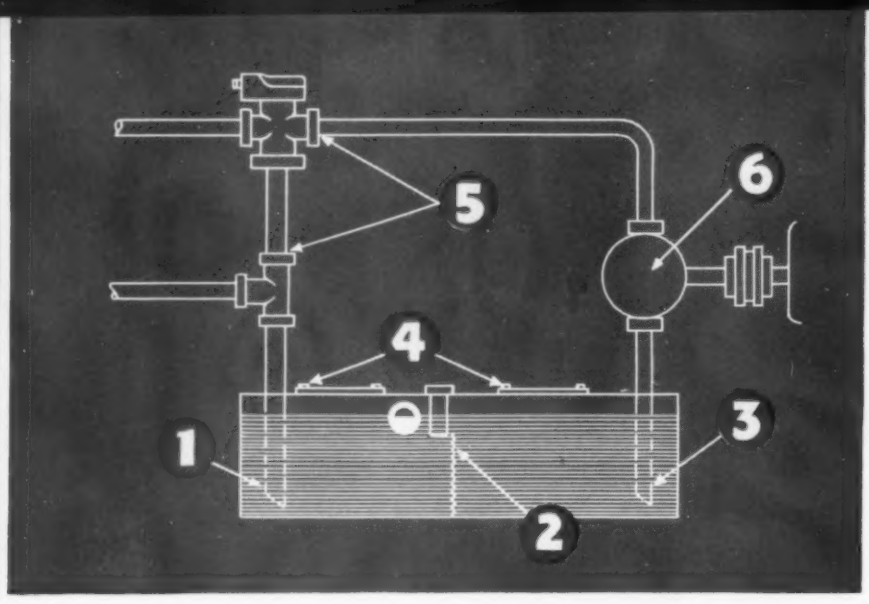

Hydraulic Oils and how to select them

Troubles in hydraulic system operation are not always caused by the oil used, but many of them can be avoided by using the right oil. Here are some suggestions for selecting the right hydraulic oil:

WHAT TO AVOID

Viscosity too high. Most easily detected when starting the unit, by sluggish operation and delayed circulation, which may damage the pump. When operating, too high a viscosity may cause over-heating and rapid oil oxidation. **Viscosity too low.** Indicated by low pressure, erratic operation. It frequently causes leakage at packings and glands. Excessive wear may develop because lubrication is inadequate.

Poor stability. Conditions under which hydraulic oils operate (heat—pressure—aeration) tend to cause the oil to oxidize and form deposits in the system. These deposits cause wear on pumps and valves, and erratic operation, which can only be corrected by an expensive cleaning operation. Deposits caused by oil oxidation should not be confused with those caused by contaminants entering the hydraulic system.

Poor demulsibility. Although normal precautions are taken to keep moisture and coolants from entering the hydraulic system, some oils will emulsify in the presence of even a small amount of moisture. The resultant frothy mixture is compressible, causing a loss of pressure and poor control of operation.

WHAT TO LOOK FOR

High Viscosity Index. Hydraulic pump and motor manufacturers have definite viscosity recommendations for oil used in their equipment. But for further protection, you need an oil of *high viscosity index*—an oil that resists changes in viscosity with changes in operating temperatures. Stanoil, for example, flows readily at starting, yet maintains suitable viscosity at the required operating temperatures.

High stability. There are many reasons why oils oxidize. Briefly, petroleum consists of various hydrocarbons, some of which unite readily with oxygen. This is called oxidation. The problem is to remove these unstable hydrocarbons. This has been accomplished in Stanoils by a unique refining process. Frequent cleaning of oil system, and oil changes necessary because of oil oxidation, are materially reduced with Stanoil.

Ease of separation from water. An oil must have good demulsibility—must separate readily from water so it will not form oil and water emulsion. Stanoil has this quality. With reasonable care to keep out dirt, Stanoil will not emulsify and can easily be separated from any water in the system.

These are just a few points to check in choosing a hydraulic oil. Let a Standard Lubrication Engineer help you pick the right grade and type of oil for your specific hydraulic jobs. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the Engineer nearest you.

Tips on a typical hydraulic system installation

1. **Oil return line** must discharge below oil level to prevent formation of air bubbles which would cause erratic operation of the pump.

2. **Baffle plate** installed between intake and return discharge helps settle out any dirt in the system and remove air bubbles introduced when filling.

3. **Oil intake pipe** should extend to within two diameters of the bottom of the reservoir, to reduce the possibility of air entering the system if the oil level is low.

4. **Hand holes** are recommended to facilitate inspection of oil and cleaning of oil reservoir, but they must be tightly sealed to prevent entrance of contaminants and water into the system.

5. **Pipe joints** should be made positively leakproof to prevent entrance of water or air and the loss of oil and pressure.

6. **Hydraulic pumps** are accurately machined units. Their continuous, efficient operation depends upon how this accuracy is maintained. The best installation can be a continual source of trouble unless a clean oil of high quality, high stability, and the right grade, is used.

Oil Is Ammunition . . . Use It Wisely

★ STANOIL ★

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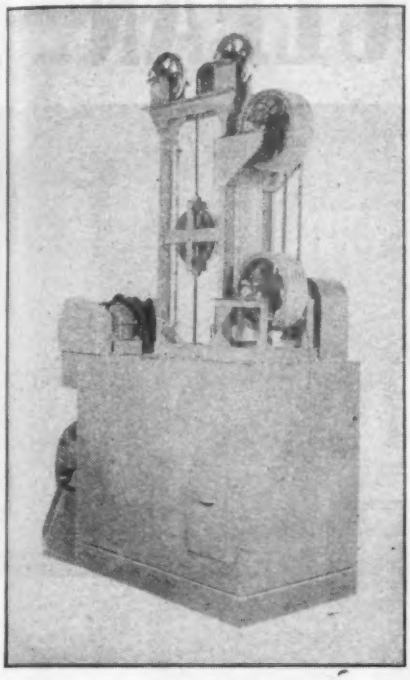
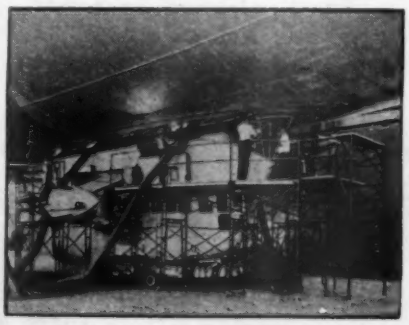
STANDARD OIL COMPANY (INDIANA)

PLANT SERVICE EQUIPMENT — Miscellaneous



WIND-UP MACHINE — *Industrial Oven Engineering Co., 11621 Detroit Ave., Cleveland, Ohio.* Wire, cable, rope, cord, paper, various kinds of tape, coated fabrics and textiles can be wound on this machine. Nov. 11, 1943, p. 125.



STEEL SCAFFOLDING—*Safway Steel Products, Inc., 6228 W. State St., Milwaukee, Wis.* Basic unit consists of two end springs held together by two crossed braces forming units 5 ft. wide, 7 ft. long and 5 ft. high. Units may be added for height desired. Feb. 18, 1943, p. 148.

INTERCOMMUNICATION SYSTEM —*Talk-A-Phone Mfg. Co., 1207½ W. Van Buren St., Chicago, Ill.* Any number of stations can hold private conference without interruption from outside stations with this Super-Chief model. Not shown. Feb. 18, 1943, p. 142.

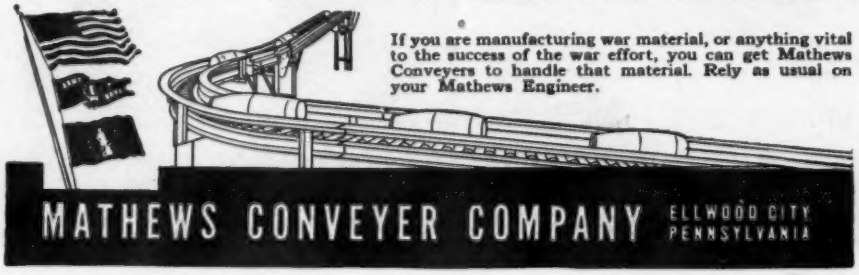
Common Carriers

VITAL TO WAR SUPPLY MOVEMENT

SPEEDY, ON-TIME TRANSPORTATION of materials, supplies and parts within a plant ranks in importance to the war effort with America's railways, trucks, ships and cargo planes.

A well-engineered Conveyer System, geared to the speed of workers and machines, is a practical method of improving production from the receiving of raw materials right through to the shipping area.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

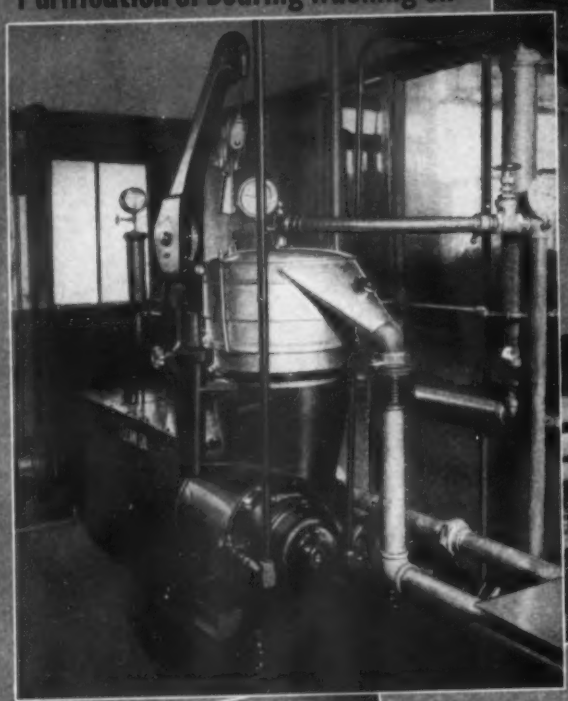


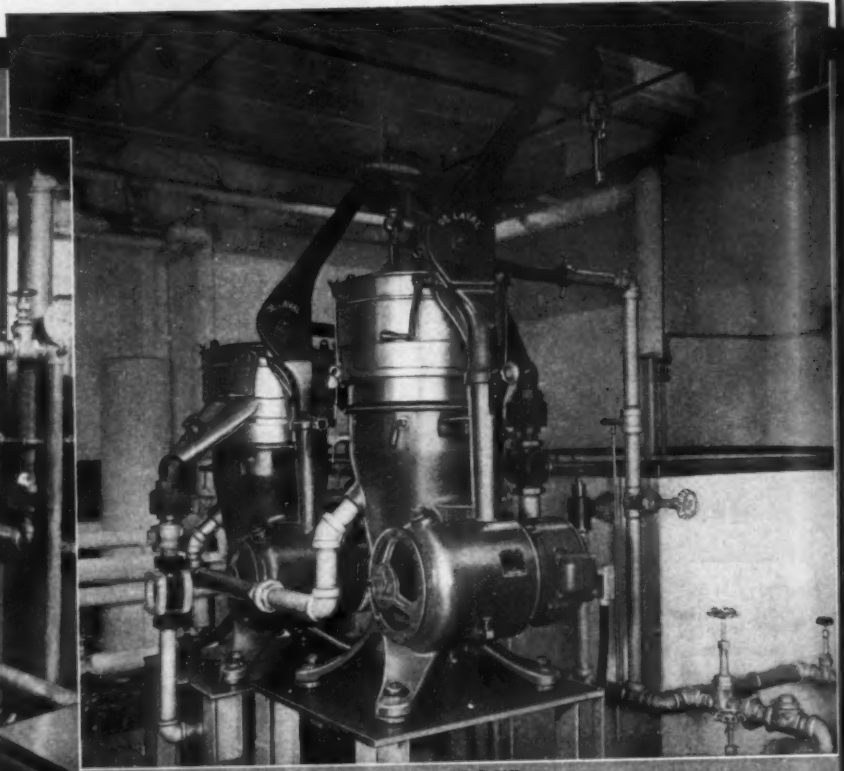
If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYER COMPANY ELLWOOD CITY PENNSYLVANIA

KEEPING OILS CLEAN - - -

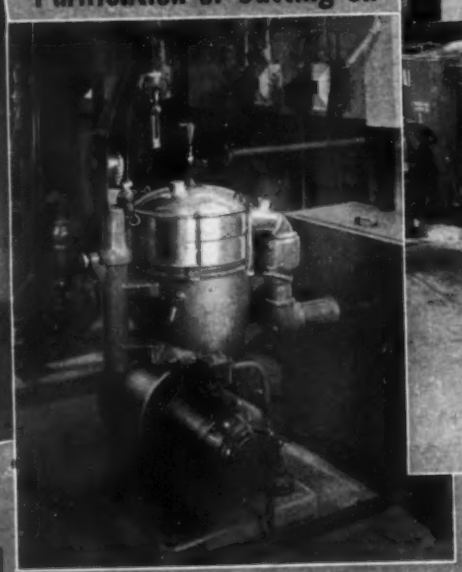
BELOW:
Purification of Bearing Washing Oil





ABOVE:
Purification of Test Oil

BELOW:
Purification of Cutting Oil



ABOVE:
Grinding Coolant Clarification

ABOVE:
Extraction of Oil from Chips

-- pays Big Dividends

DE LAVAL centrifugal equipment provides a time-proved method of keeping cutting oil, grinding coolant, washing oil, and lubricating oils of all kinds free from foreign substances, such as metallic particles, dirt, water or sludge.

The continuous removal of impurities from oils and other liquids through use of De Laval Purifiers and Clarifiers, and the effective recovery of cutting oil by means of De Laval Chip Oil Extractors, result in economies which pay many worthwhile dividends: The quality of work is improved; oil and time are saved; tools last longer; rejects are minimized: and production is speeded up.

There is a De Laval Purifier, Clarifier, or Extractor for every specific need and for plants of all sizes. Each unit is built to give long and dependable service.

When planning how to use post-war manufacturing facilities to best advantage, it will pay you to tap De Laval's experience in solving oil purification and clarification problems. Write for details.

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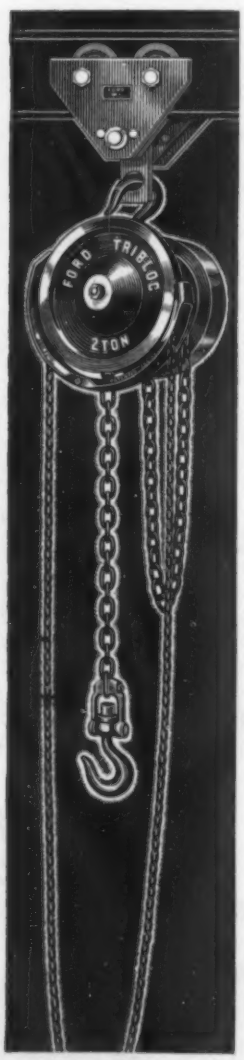
165 Broadway, New York 6 427 Randolph St., Chicago 6
DE LAVAL PACIFIC COMPANY, 61 Beale St., San Francisco 19
THE DE LAVAL COMPANY, Limited
MONTREAL PETERBOROUGH WINNIPEG VANCOUVER

☆ DE LAVAL ☆ *Buy War Bonds*

OIL PURIFIERS--COOLANT PURIFIERS

DON'T GET CAUGHT WITH YOUR PLANTS DOWN!



Your *first* job is to win the war. But in time of war—prepare for peace. Because peace brings a huge backlog of orders for peacetime products—and the demand for immediate delivery. Don't let peace catch you with your plants down.

FORD TRIBLOCS can be of tremendous help in meeting tomorrow's production demand. They are fast in operation—they are sturdy—they are on the job ready for instant use.

TRIBLOCS save money for their users, because of their first low cost, and because of their low maintenance expense.

The **FORD TRIBLOC** is a quality spur-gear hoist. It is made throughout of high-grade drop forgings and malleable castings of certified grade. Its ACCO high carbon heat-treated chain has great strength and high elastic limit. Write for information on **TRIBLOCS** in ¼-ton to 40-ton capacities.

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FORD CHAIN BLOCK DIVISION

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AMERICAN CHAIN & CABLE COMPANY, INC.
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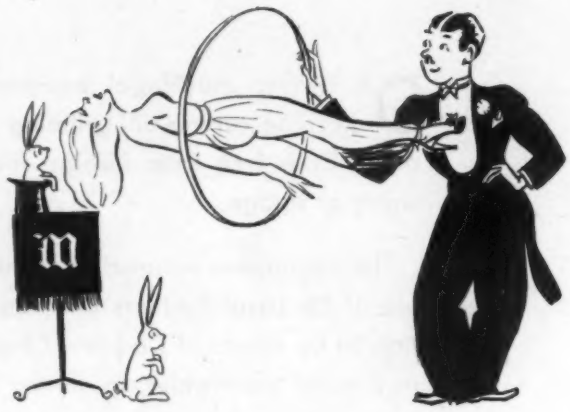
It's No Trick At All With TORIT



TORIT DUST COLLECTORS

make the collecting of abrasive dust particles a simple matter. Portable and completely self-contained they are easily attached to existing machinery and, when necessary, they can be moved about to fit into new production layouts.

Torit Dust Collectors trap grinding dusts at their source and the cleaned air is re-circulated into the room . . . saving employes' health, valuable machinery and reducing heating bills. For complete information write:

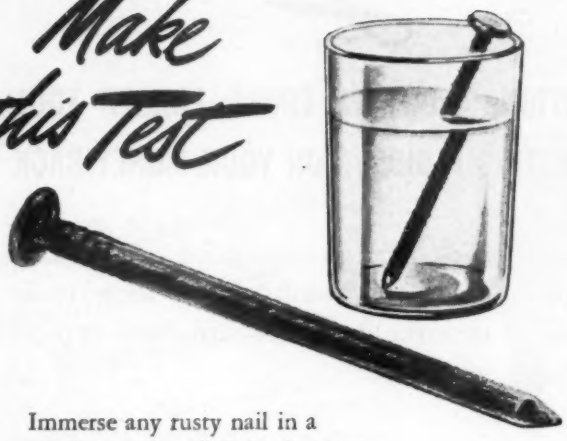
TORIT
Manufacturing Co.
280 Walnut Street
St. Paul 2, Minnesota

Self-contained units for carrying away dust-laden air around grinding, cutting and polishing wheels.

TORIT Dust Collectors
SELF-CONTAINED UNITS

What to do about Rust?

Make this Test



Immerse any rusty nail in a small quantity of Cities Service Rust Remover. If badly rusted, allow to remain for several minutes. You can actually see the rust dissolve.

See the Results

Remove nail and wipe dry with cloth or tissue. Note the complete absence of rust and the way the original surface reappears.

CITIES SERVICE RUST REMOVER has been tested for four years throughout a small, highly industrialized area in the East, where it has earned a unique reputation for performance. RUST REMOVER is a clean, clear liquid, practically odorless, non-inflammable, easily applied, and harmless to handle by those not allergic to specific chemicals. It is fast-acting, and, although heating somewhat accelerates results, general application is recommended at normal temperature (60°-90°F.). RUST REMOVER is effective on chromium, copper, aluminum, steel and iron.

5 Big Advantages

1. Non-Inflammable
2. Harmless to Normal Skin
3. Makes Metals Chemically Clean
4. Removes Rust by Chemical Action
5. Free from Muriatic, Sulphuric, Nitric and Oxalic Acids or Cyanide.

See a Free Demonstration of Rust Remover on Your Own Equipment.

(Available only in Cities Service marketing territory EAST of the Rockies.)

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Gentlemen: I'd like to test RUST REMOVER on my own equipment FREE OF CHARGE. Send me details.

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YOU'LL GET INCREASED PRODUCTION, SMOOTHER FINISH, LONGER TOOL LIFE FROM SAFCO ENGINEERED CUTTING FLUIDS... OR YOUR MONEY BACK

We've helped others increase their production without increasing manpower or adding to their equipment—*simply by selection of the right lubricant for a given job.* In some cases the results have been truly remarkable. Here are four typical examples:

Chrome-Moly Steel Machined 30% Faster

In a tapping operation on heat treated chrome-moly steel forgings for aircraft parts, SAFCO No. 560 Cutting Oil was tried at the recommendation of the Swan-Finch technical man.

Results:

A 30% increase in production
Tap life increased 6 times
Threads brighter and smoother
Rejects eliminated

In addition, machine operators like SAFCO No. 560 because it is clean to use and keeps machines cleaner.

There may be an operation in *your* plant where SAFCO No. 560 Cutting Oil or another of our "engineered" lubricants for the metal working field can increase your production efficiency. Why not find out by calling in a Swan-Finch technical man?

Eliminates Staining; Speeds Cleaning in Drawing Nickel Silver

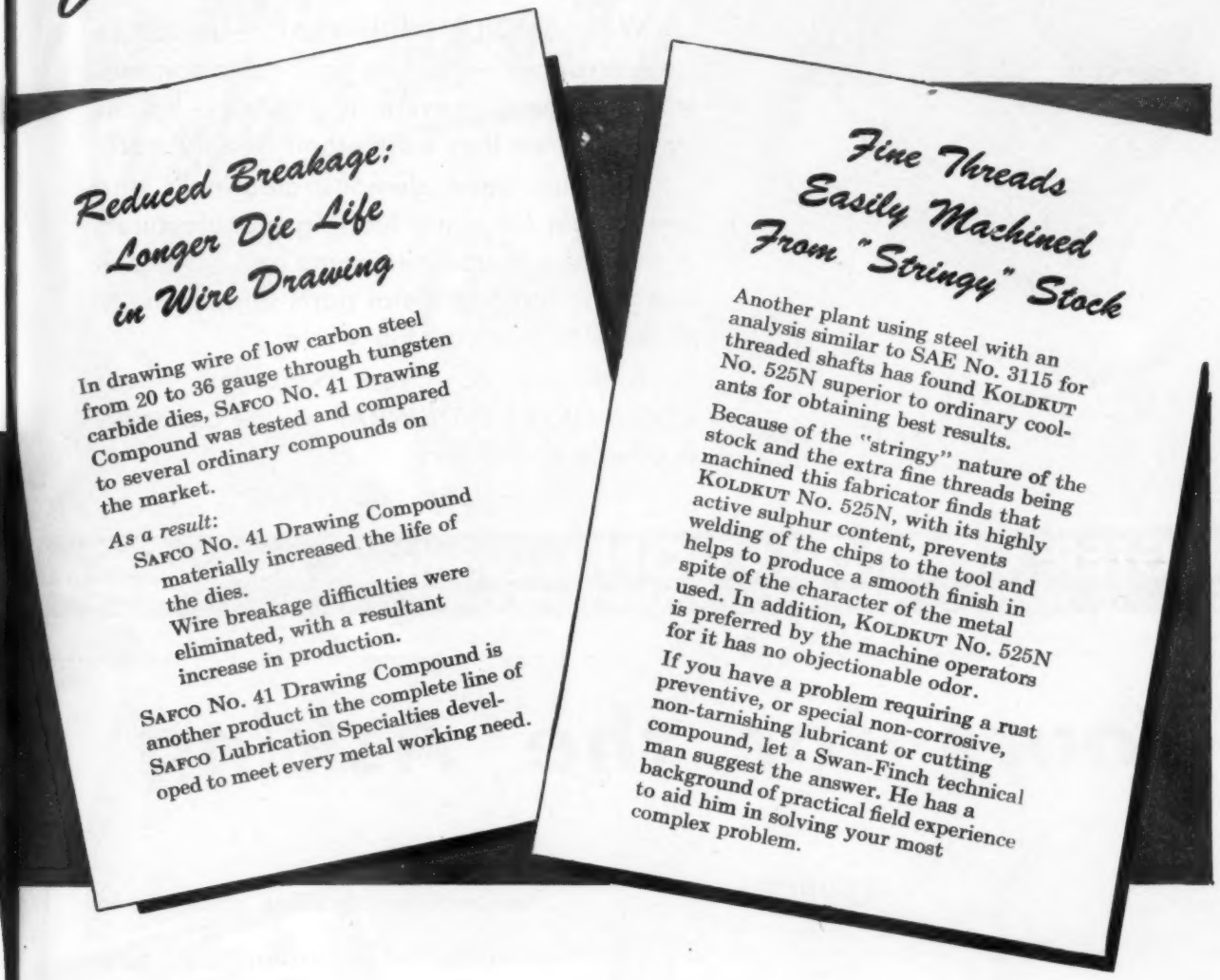
In drawing nickel silver to form shells for milking machines, the use of SAFCO Drawing Compound No. 32 was prescribed by a Swan-Finch technical representative. In comparative tests, the SAFCO Drawing Compound consistently produced better results:

Black stains that appeared on pieces drawn with the oils formerly used were eliminated.
Easier cleaning of drawn pieces was obtained.

The SAFCO line of Cutting and Drawing Oils and Compounds includes a product developed to meet virtually every operating condition. The Swan-Finch technical man may have the right solution to your problem.

Swan-Finch Oil Corporation

Performance on a Money-Back Guarantee


Reduced Breakage; Longer Die Life in Wire Drawing
In drawing wire of low carbon steel from 20 to 36 gauge through tungsten carbide dies, SAFCO No. 41 Drawing Compound was tested and compared to several ordinary compounds on the market.
As a result:
SAFCO No. 41 Drawing Compound materially increased the life of the dies.
Wire breakage difficulties were eliminated, with a resultant increase in production.
SAFCO No. 41 Drawing Compound is another product in the complete line of SAFCO Lubrication Specialties developed to meet every metal working need.
Fine Threads Easily Machined From "Stringy" Stock
Another plant using steel with an analysis similar to SAE No. 3115 for threaded shafts has found KOLDKUT No. 525N superior to ordinary coolants for obtaining best results.
Because of the "stringy" nature of the stock and the extra fine threads being machined this fabricator finds that KOLDKUT No. 525N, with its highly active sulphur content, prevents welding of the chips to the tool and helps to produce a smooth finish in spite of the character of the metal used. In addition, KOLDKUT No. 525N is preferred by the machine operators for it has no objectionable odor.
If you have a problem requiring a rust preventive, or special non-corrosive, non-tarnishing lubricant or cutting compound, let a Swan-Finch technical man suggest the answer. He has a background of practical field experience to aid him in solving your most complex problem.

You see, there's a SAFCO Lubricant for every metal working task, every type of metal, every machine operation. From our complete line of specially engineered lubricants, we can select the right *one*—or the right combination for any given job.

Why not let us *demonstrate* how the correct lubricants for *your* needs can give you better performance? All we need is your cooperation in giving us the facts...letting a Swan-Finch technical representative analyze the operations in your plant *before* making a recommendation. Give the SAFCO Lubricant he recommends a fair trial. If you are not satisfied that you are getting a better production job...return the unused portion of the product and we'll cancel the invoice!

Write or phone our nearest office and ask to have the Swan-Finch technical representative in your neighborhood call. SWAN-FINCH OIL CORPORATION, R.C.A. Building (West), New York 20, N. Y.; 2596 Hart Avenue, Detroit 14, Mich.; 201 North Wells Street, Chicago 6, Ill.

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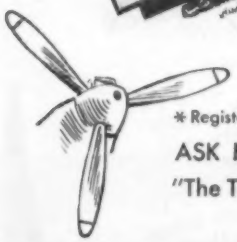
With ANGIER INDUWRAP*—Inhibitive Dual Wrapper—you can fight corrosion and win. You can prevent it entirely—kill its causes before they begin their deadly work.

This has been demonstrated over and over again by many leading manufacturers of oil-slushed airplane engine and other polished and finished metal parts shipped to all of the war fronts of the world.

Anticipate now your peacetime needs when ANGIER INDUWRAP will be generally available to industry.

Investigate INDUWRAP.



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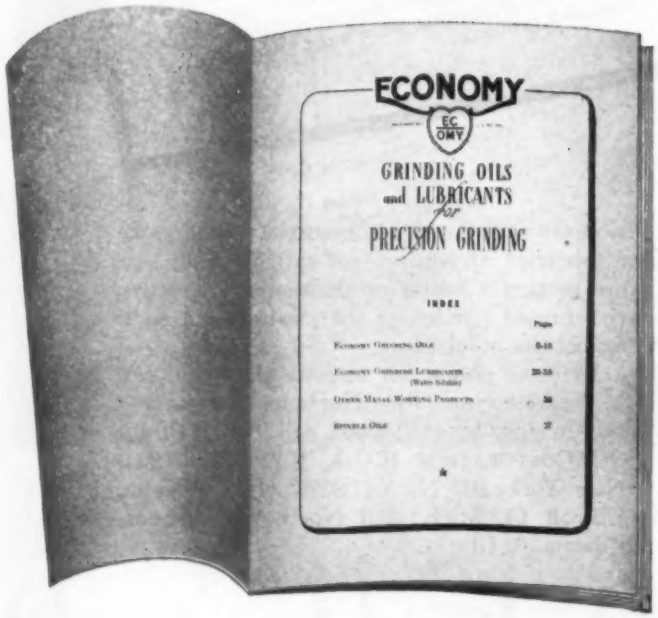

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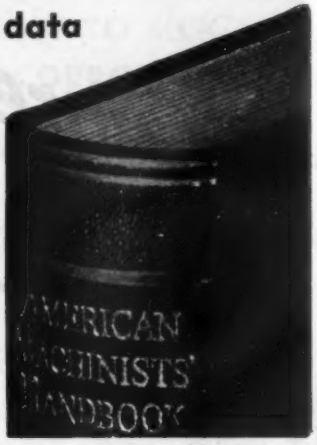

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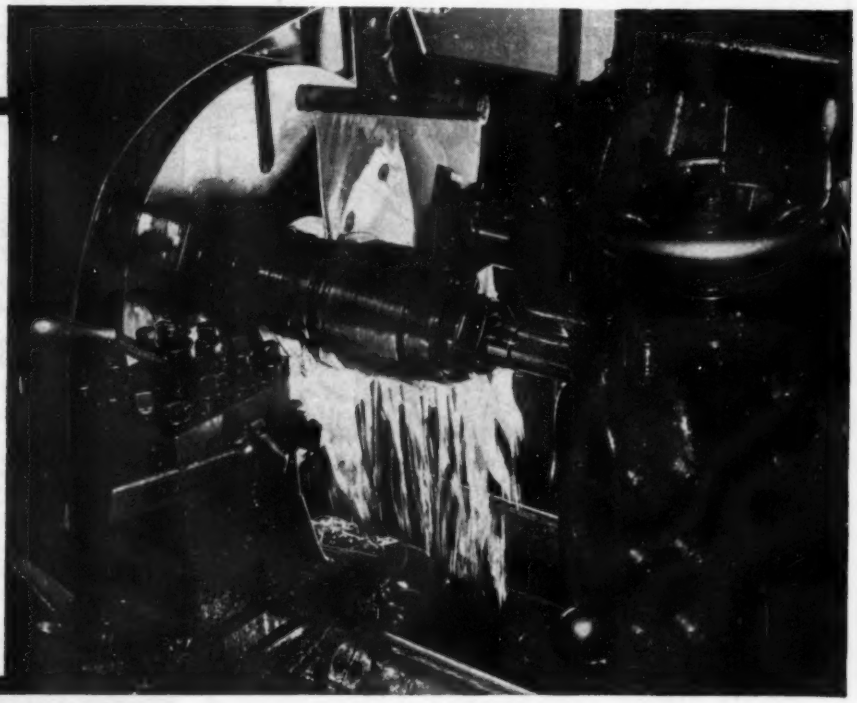

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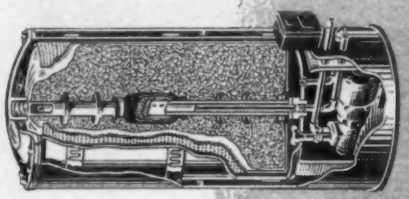

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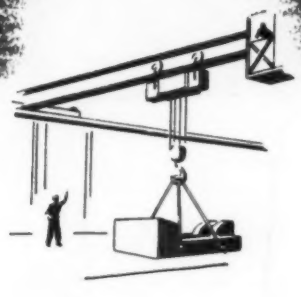

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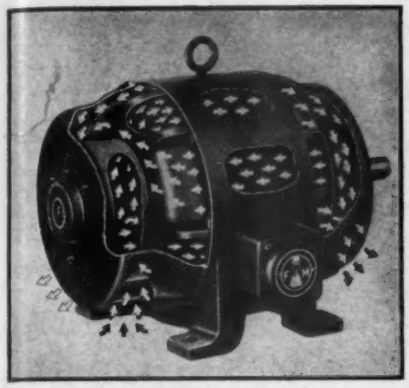
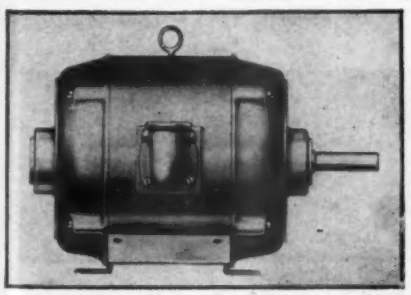


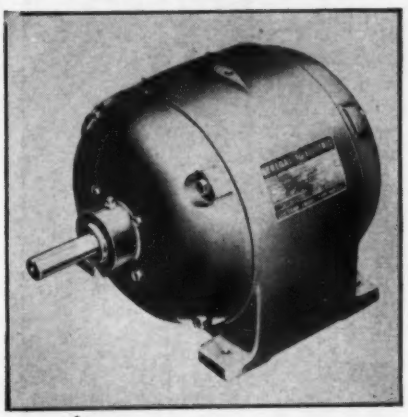
INDUCTION MOTOR — *Fairbanks-Morse & Co., 600 S. Michigan Ave., Chicago, Ill.* Cross-flow ventilation is a feature of this general purpose, continuous-duty, polyphase squirrel cage unit. Oct. 28, 1943, p. 132.

MOTOR—*General Electric Co., Schenectady, N. Y.* This vertical, hollow shaft synchronous motor is suited for pumping applications where a large volume of fluid is handled. Sept. 2, 1943, p. 128.

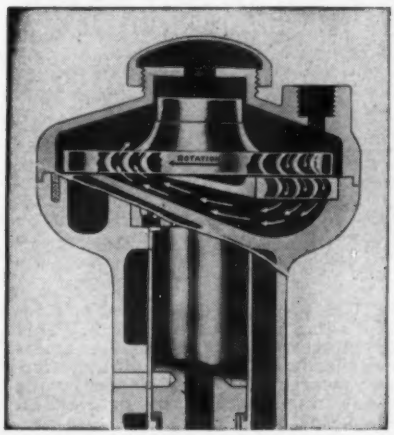


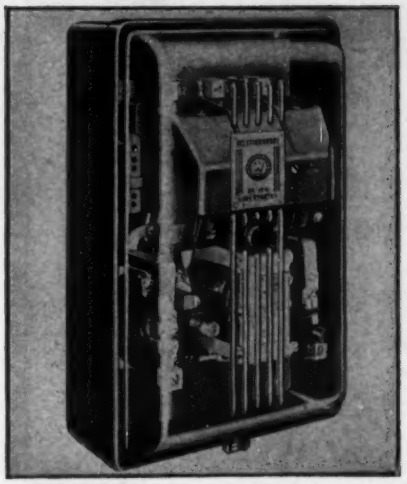
MOTORS—*Robbins & Myers, Springfield, Ohio.* Uni-Shell electric motor line has been developed in which all types in any one frame size are interchangeable. Apr. 29, 1943, p. 118.

VERTICAL MOTOR—*General Electric Co., Schenectady, N. Y.* D.C. motors ranging from 40 to 200 hp. are furnished for both constant and adjustable speeds, and designed for low-thrust applications on pumps and machine tools. Aug. 5, 1943, p. 138.

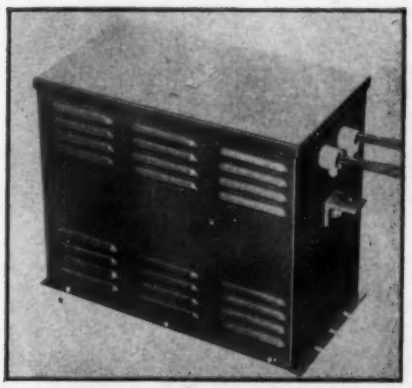


MOTOR—*General Electric Co., Schenectady, N. Y.* For use where abrasives, chemicals and excessive dirt are encountered, this tri-clad motor is available in polyphase, induction type, and the single-phase, capacitator type. June 24, 1943, p. 140.

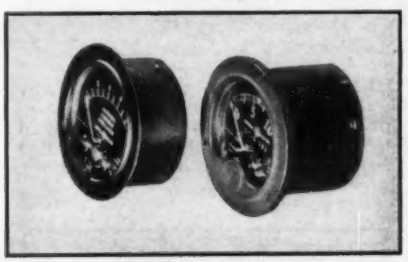




LINESTARTER—*Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.* This is a compact unit designed for group mounting, built-in applications or remote mountings. Mar. 18, 1943, p. 132.



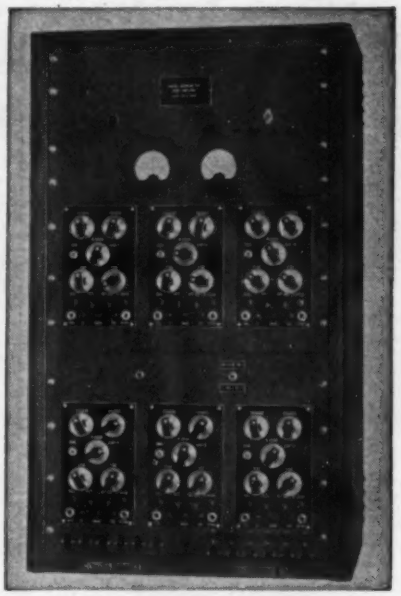
VOLTAGE STABILIZER — *General Electric Co., Schenectady, N. Y.* This equipment can be applied for voltage regulation of X-ray machines, calibration of meters, instruments, relays. Apr. 1, 1943, p. 126.



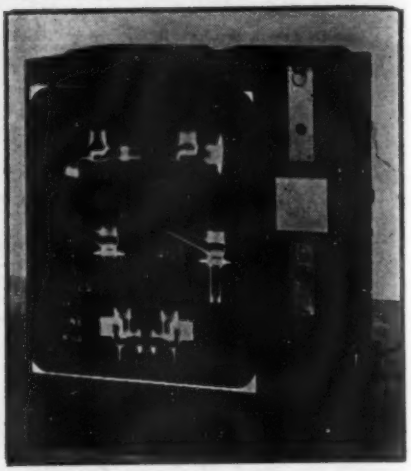
PANEL INSTRUMENTS — *General Electric Co., Schenectady, N. Y.* A line of thin, direct current panel instruments developed by the company is suited for use in aircraft, radio and communications equipment, and for machinery application. Oct. 14, 1943, p. 154.

TURBINE MOTOR—*Onsrud Machine Wks., 3910 Palmer St., Chicago, Ill.* A solid milled rotor is provided in this air turbine motor developed for Onsrud tools and also furnished for other uses. Nov. 25, 1943, p. 128.

DRIVE CONTROL — *Electron Equipment Corp., Palm Springs, Calif.* A shunt wound direct current motor can be connected to an alternating current line for obtaining adjustable machine speeds by this Eleco RPM control. Aug. 5, 1943, p. 136.

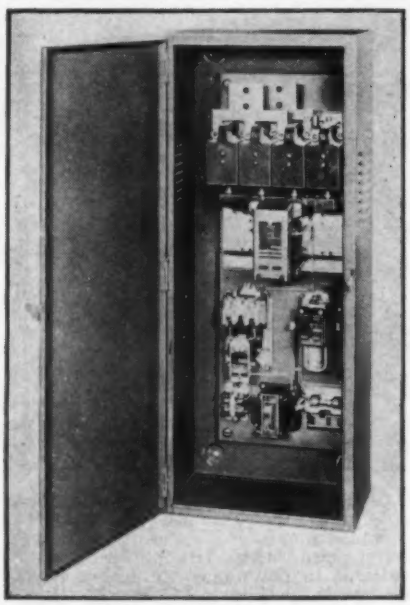


ANALYZER—*Televiso Products, Inc., 6533 N. Olmsted, Chicago 31, Ill.* Strains in such structures as railroad rails and beams are indicated and analyzed with this instrument. Dec. 23, 1943, p. 130.



ILLUMINATOR — *Kelley-Koett Mfg. Co., 212 W. 4 St., Covington, Ky.* The Keleket high-intensity X-ray unit increases intensity of illumination about four times. Sept. 30, 1943, p. 118.

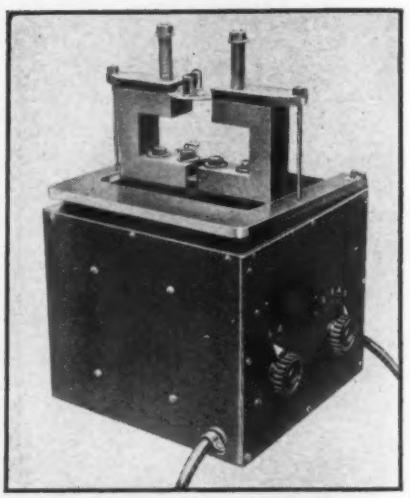
BRIDGE—*Industrial Instruments, Inc., 156 Culver Ave., Jersey City, N. J.* Model K-1 self-contained Kelvin bridge has voltage source of 60 cycles a.c. Dec. 23, 1943, p. 121.



A. C. CONTROL—*Square D Co., Industrial Controller Div., Milwaukee, Wis.* The safety control for transformer type arc welders can be used with any make or model. It automatically disconnects the welder transformer after the arc is broken. July 22, 1943, p. 142.

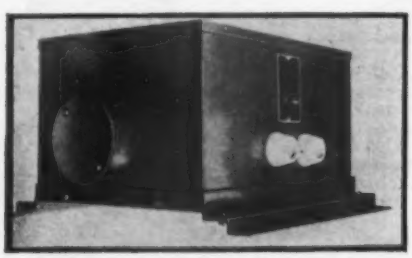
PANEL PLAN—*Square D Co., 6060 Rivard St., Detroit 11, Mich.* Obsolete panel boards can be converted to circuit breakers with considerable increase in the number of circuits by utilizing the Multi-Breaker convertible panel plan. Not shown. Oct. 14, 1943, p. 160.

SWITCH—*General Electric Co., Specialty Div., Schenectady, N. Y.* This door interlock switch provides emergency control circuit interruption where access doors are opened while the power is on. Not shown. Nov. 11, 1943, p. 132.



TRANSFORMER — *American Car & Foundry Co., 30 Church St., New York, N. Y.* Five heat speeds are available in this Type T-37, a.c.f. soldering transformer. Sept. 16, 1943, p. 136.

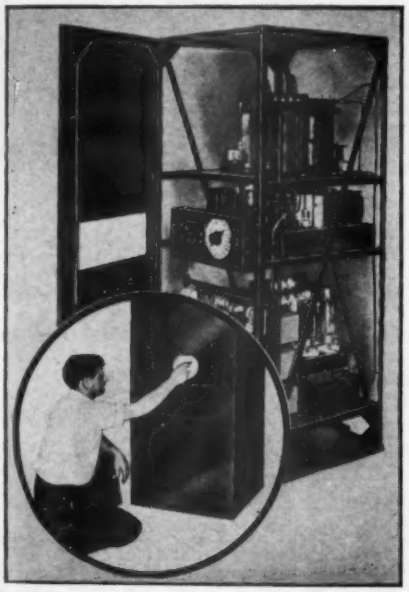
RECTIFIER — *Electron Equipment Corp., Palm Springs, Calif.* The Eleco rectifier for direct current is made in stationary and mobile models in all voltages to supply direct current for magnetic equipment, traveling cranes, brakes, projectors, locomotives, plating and chemical uses. Not shown. June 10, 1943, p. 140.



TRANSFORMER — *Acme Electric & Mfg. Co., Cuba, N. Y.* Cold cathode lighting transformer has capacity of 120 miliamperes in 3000, 4000, 6000, 9000, 12000 or 15000 volt secondaries. May 27, 1943, p. 142.

TERMINAL HEAD—*Arklay S. Richards Co., Newton Highlands, Mass.* The No. 2150 terminal head is suited for use on thermocouples for heat-treating control, and furnished for ½, ¾, or 1 in. pipe thread. July 8, 1943, p. 134.

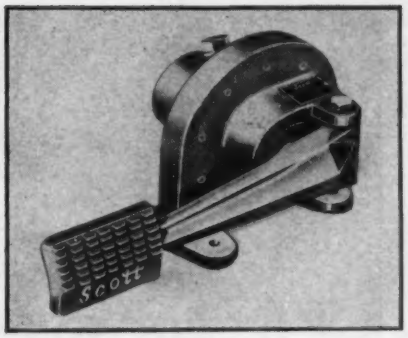
MOTOR STARTER — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* For full or reduced voltage starting, dynamic braking, reversing and special applications, Type H motor starter is suited for induction synchronous motors, rated up to 1,000 hp. at 2,300 volts, and 1,750 hp., and 4,600 volts, 3-phase, 60 or 50 cycles. Aug. 5, 1943, p. 140.



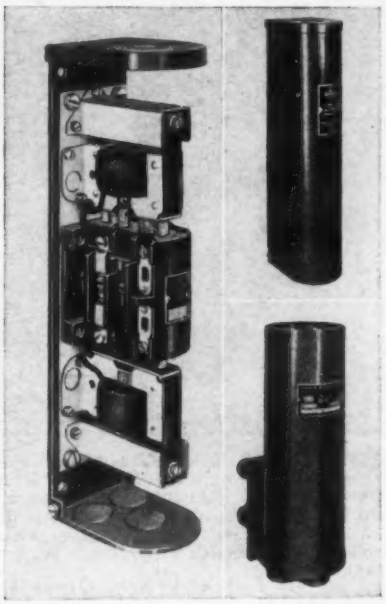
GENERATOR—*Communication Measurements Laboratory, 120-24 Greenwich St., New York, N. Y.* Frequency range of 300 to 3,500 cycles is provided in the CML 1400 electronic generator for tests on the production line. Oct. 28, 1943, p. 130.

LIGHT BULB HOODS — *Reynolds Electric Co., 2650 W. Congress St., Chicago, Ill.* Reco Safety color hoods for standard bulbs are available in blue or green colored glass. Not shown. June 10, 1943, p. 134.

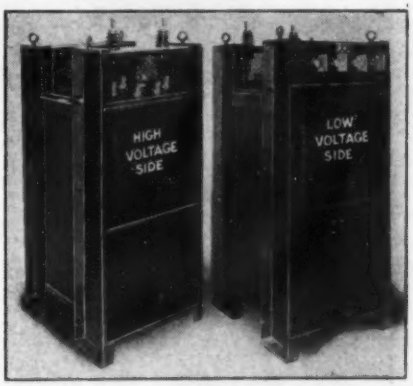
MOTOR STARTER—*Monitor Controller Co., Baltimore, Md.* Installation of this Thermaload V solenoid starter can be made in a small space. Not shown. Mar. 4, 1943, p. 134.



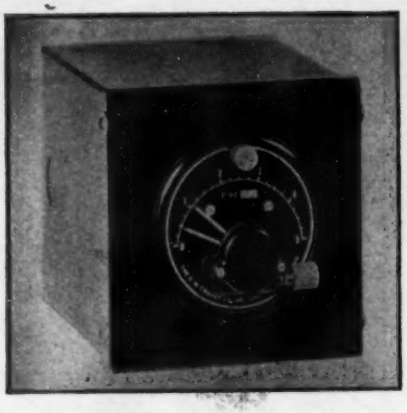
GENERATOR—*Scott Aviation Corp., Lancaster, N. Y.* Although developed for actuating wheel brakes in aircraft, this hydraulic pressure generator is suited for many other fields; has pressure up to 500 lb. May 13, 1943, p. 134.



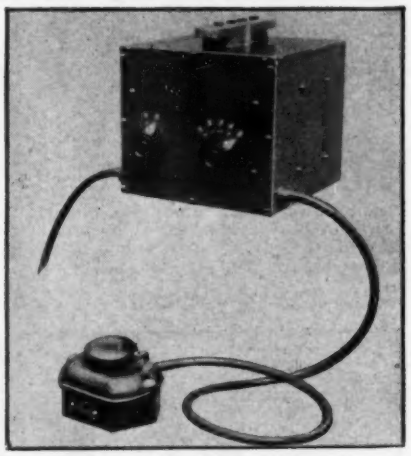
REVERSING SWITCH—*Furnas Electric Co., 438 McKee St., Batavia, Ill.* Single unit construction instead of two separate contactors is a feature of this 5-hp. magnetic reversing switch for operation on 110, 220, 440 or 550 volts, single or three-phase motor. May 27, 1943, p. 146.



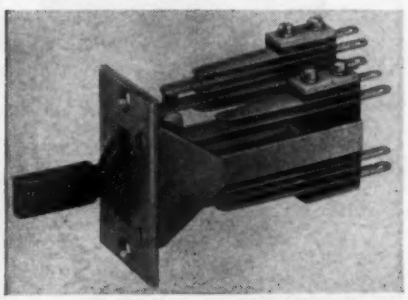
TRANSFORMER—*Eisler Engineering Co., 740-770 S. 13 St., Newark, N. J.* This air-cooled dry type unit is recommended for indoor installation. Apr. 1, 1943, p. 120.



TIMERS—*R. W. Cramer Co., Inc., Centerbrook, Conn.* Two models of this synchronous motor-driven timer are available for timing electrical circuits. Mar. 18, 1943, p. 136.

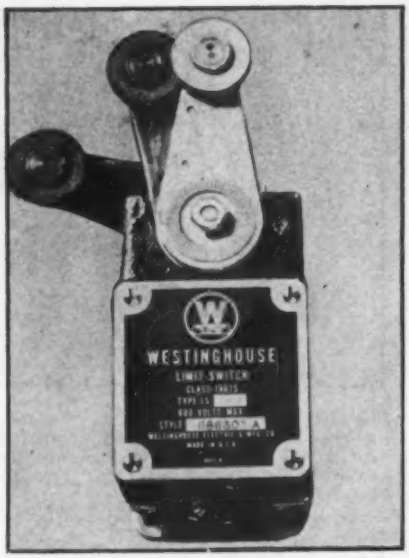


TRANSFORMER—*American Car & Foundry Co., 30 Church St., New York, N. Y.* This small Berwick electrical metal heater transformer has ten heat speeds and foot treadle control, and is built for heating condenser assemblies. Feb. 18, 1943, p. 138.



SWITCH—*Donald P. Mossman, Inc., 6133 N. Northwest Highway, Chicago, Ill.* The No. 0-42 lever switch is suited for use in aircraft, testing apparatus, and wide range of industrial applications. Feb. 18, 1943, p. 148.

PUSHBUTTON — *Northern Engineering Wks., 2615 Atwater St., Detroit, Mich.* This multiple-speed pushbutton, adaptable to machines where pilot or relay circuits are used, provides up to five speeds. Not shown. May 27, 1943, p. 142.



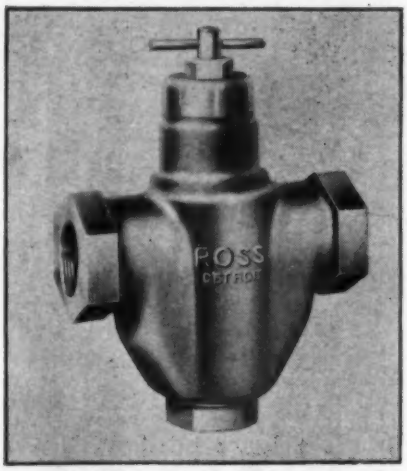
UNIT SWITCH—*Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.* This unit is for general purpose application; of the roller arm, spring return type. Feb. 18, 1943, p. 152.

BUSHING — *Bushings, Inc., 3447 W. Eleven Mile Ave., Berkely, Mich.* Rubberflex insulated bushings absorb vibration and shock, take torsional and radial movement without lubrication. Not shown. Mar. 4, 1943, p. 126.

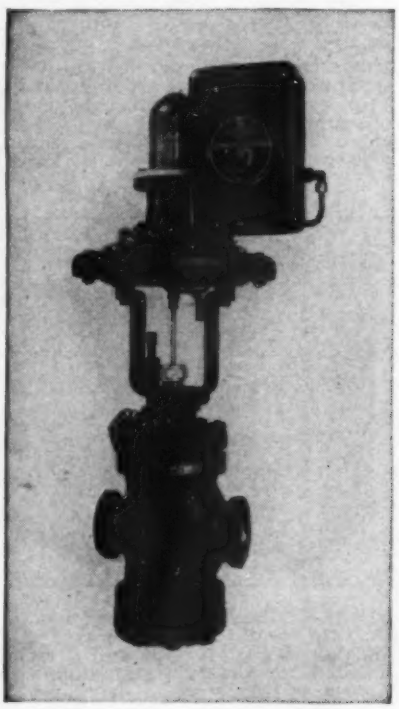
TRANSFORMER — *Acme Electric & Mfg. Co., Cuba, N. Y.* This welding transformer operates on primary circuits of 115 volts, single phase, 60 cycle, and has secondary characteristics of 75 volt, 1,600 amp. Jan. 7, 1943, p. 122.

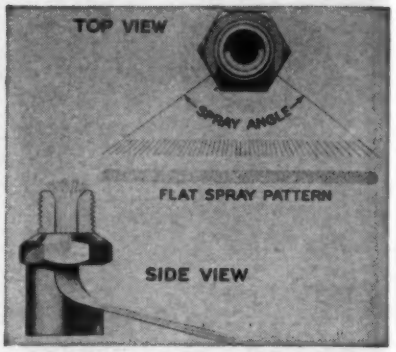
MICRO-POSITIONER — *Foxboro Co., Foxboro, Mass.* The improved vernier valvactor for pneumatic motor valves insures precise valve response. Dec. 23, 1943, p. 134.

VALVE—*Anker-Holth Mfg. Co., 332 S. Michigan Ave., Chicago 4, Ill.* This is a quick operating valve for general use on all types of pneumatic equipment. Dec. 23, 1943, p. 136.

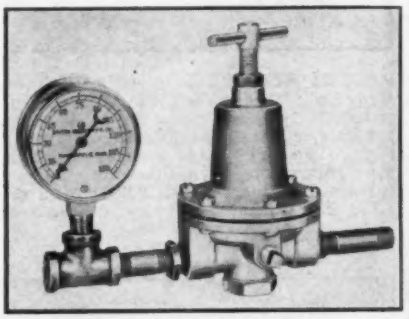


AIR CONTROL VALVE—*Ross Operating Valve Co., 6489 Epworth Blvd., Detroit, Mich.* Accurate split-second timing of piston movement is provided in this air-speed control valve which has wide range flow control. Aug. 5, 1943, p. 130.

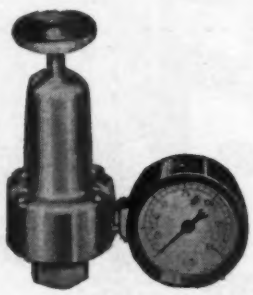




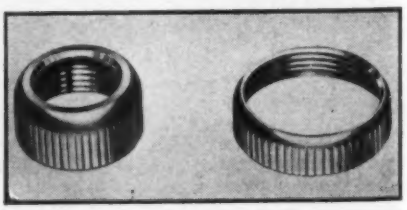
NOZZLE—*Spraying Systems Co., 4025 W. Lake St., Chicago, Ill.* A wide flat spray is provided in this nozzle designed for use in spraying eliminator plates and similar applications. Dec. 23, 1943, p. 134.



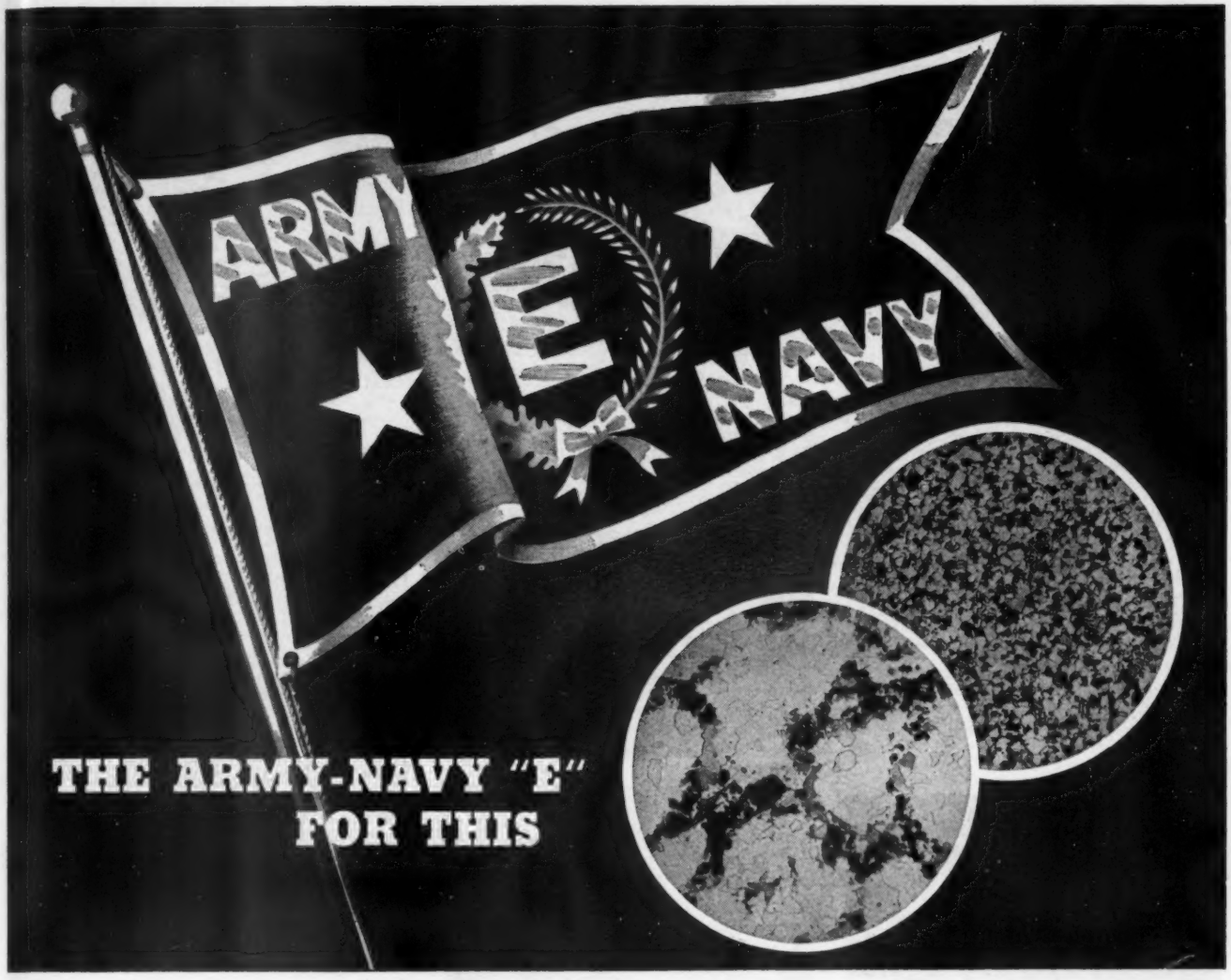
REGULATOR — *Dayton Rogers Mfg. Co., 2835 12 Ave. S., Minneapolis, Minn.* This regulator valve is supplied with a pressure gage for reducing shop airline to the desired working pressure. Oct. 14, 1943, p. 146.



AIR REGULATOR — *W. R. Brown Corp., 5720 Armitage Ave., Chicago 39, Ill.* The instrument is suited for installation on air tanks, air lines, equipment and machinery for regulating gripping force of vises. Sept. 30, 1943, p. 116.



COUPLING NUT—*Remsen Co., 8059 Melrose Ave., Los Angeles, Calif.* AN 3054 series is fabricated from aluminum and available in sizes 3, 4, 6, 8, 10, 12 and 16. Sept. 2, 1943, p. 132.



On September 5th, 1942, our Mine and Mill at Climax, our Research Laboratory at Detroit and our Conversion Plant at Langeloth, Pennsylvania, were given the Army-Navy Production Award. Since then the award has been twice renewed. The two-starred flag we fly represents a full year of contribution to the war effort recognized by the Army and Navy.

Winning the award by the laboratory began in 1931. It was then that it was founded to meet our needs for authoritative information about molybdenum—containing ferrous materials.

Pearl Harbor intensified our work with producers of war equipment—work that is aided considerably by the accumulated data and experience gained in over ten years of concentrated research.

We are particularly proud to be among those companies whose laboratories are entitled to fly the Army-Navy "E".

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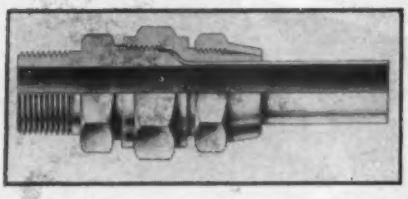
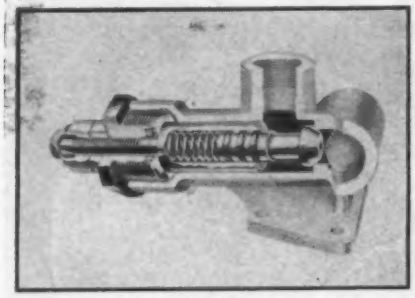
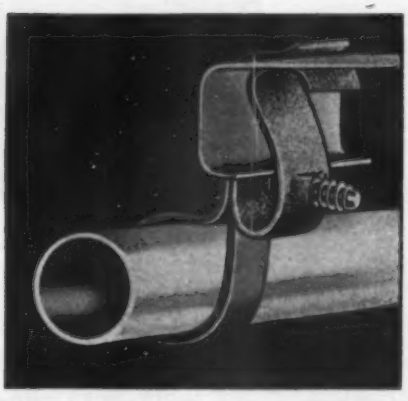


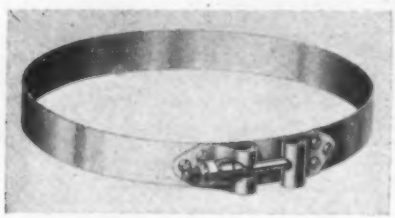
TUBE FITTING — *Cotner-Wilkinson Co., Logansport, Ind.* This unit does not require threading, welding or soldering; available in double nut and single nut series. Aug. 19, 1943, p. 136.



RELIEF VALVE—*Merit Engineering, Inc., 40 Clifford St., Providence, R. I.* This unit is suited for machines in which hydraulic controls are used. July 22, 1943, p. 140.

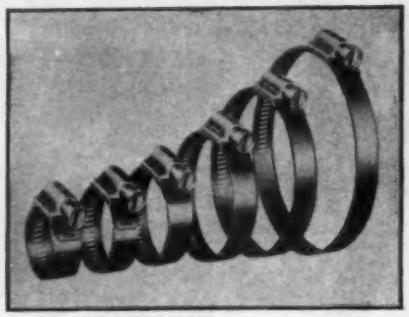


SPEED NUT — *Tinnerman Products Co., Inc., 2102 Fulton Road, Cleveland, Ohio.* It snaps around rolled section or stringers and eliminates need for drilling holes. June 10, 1943, p. 136.

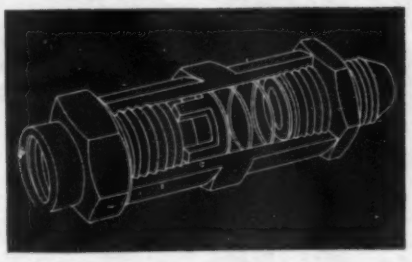


CLAMP—*Marman Products Co., Inglewood, Calif.* For use in ventilation, super-charger, intercooler and similar installations, this aluminum alloy clamp is available in sizes from 2 in. diameter up. Nov. 25, 1943, p. 138.

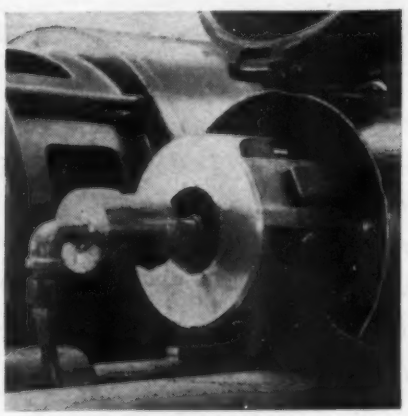
PIPE PLUGS — *American Molded Products Co., 1644 N. Honore St., Chicago, Ill.* These plugs provide protection for threads of units; furnished in sizes ⅜, ½, ⅝, ¾ and 1 in. Not shown. May 27, 1943, p. 146.



HOSE CLAMP — *Aircraft Standard Parts Co., 1711 Nineteenth Ave., Rockford, Ill.* Aero-Seal hose clamps are available in 14 sizes, ranging from ¾ to 4 in. diameter. May 13, 1943, p. 134.



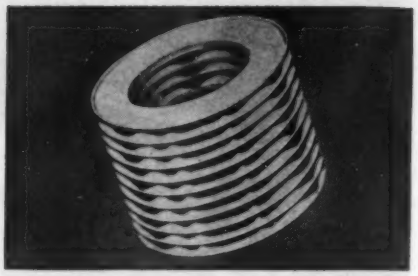
CHECK VALVE — *American Screw Products, Los Angeles, Calif.* This is a universal unit which allows 12 combinations with one body. Mar. 18, 1943, p. 140.



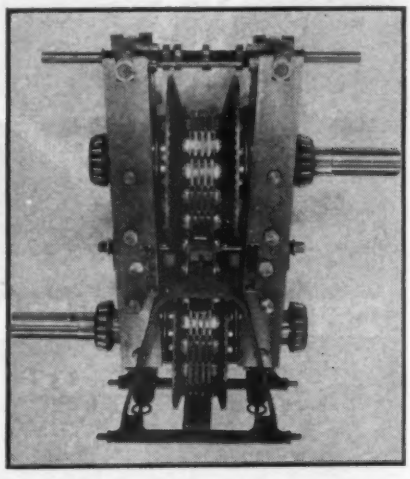
PRESSURE JOINT — *Johnson Corp., Three Rivers, Mich.* By means of this special rotary joint, coolant can be admitted to the inside of spindle of turret lathes and conducted directly to point of machining. Sept. 30, 1943, p. 128.

FITTINGS—*United States Rubber Co., Mechanical Goods Div., Rockefeller Center, New York, N. Y.* This company has available a line of fittings for aircraft made of Asbeston, a woven asbestos fabric. Not shown. Mar. 4, 143, p. 136.

ANGLE BRACKET—*Tinnerman Products, Inc., 2102 Fulton Rd., Cleveland, Ohio.* This combination bracket and fastener features an integrally formed speed nut in one or both sides of the bracket. Not shown. Mar. 18, 1943, p. 140.



METAL BELLOWS — *Cook Electric Co., 2700 Southport Ave., Chicago, Ill.* Feature of this Spring Life bellows is construction of individually fabricated diaphragms. Mar. 4, 1943, p. 136.



GEAR MECHANISM—*Link-Belt Co., Philadelphia 40, Pa.* Infinitely variable speed P.I.V. gear mechanism is now available without housing for integral designing into machine tools. Oct. 14, 1943, p. 146.

MICROPOSITIONER—*Barber-Colman Co., Rockford, Ill.* For aircraft applications, this unit is suited for remote positioning of control motors, control of air valves and other aircraft installations. July 8, 1943, p. 146.

HANDLE WHEEL—*Gibbons Mfg. Co., 11 Gordon St., Worcester 4, Mass.* The Safety handle wheel is recommended for, rapid traverse machines where handle wheels or cranks are in fast motion. Not shown. Aug. 19, 1943, p. 140.

IRON ORE MINES—MOTHERS OF STEEL

The iron ore mines are mothers of steel—the metal with which the progress and prosperity of America have been achieved . . . its high standard of living attained.

From these iron ore mines began the great expansion of this country, the building of transcontinental railroads and telegraph systems, the growth of cities and towns, the development of steamship lines and telephone service, establishment of new industries—all providing more gainful employment—opening new avenues of opportunity.

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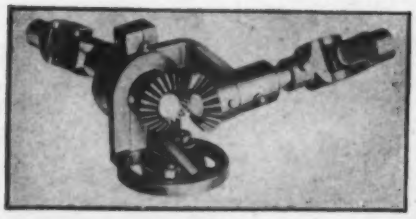
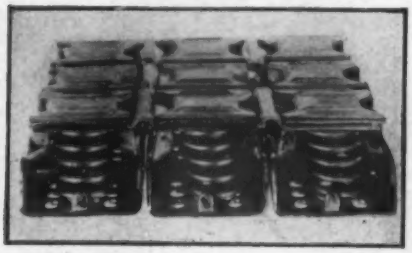
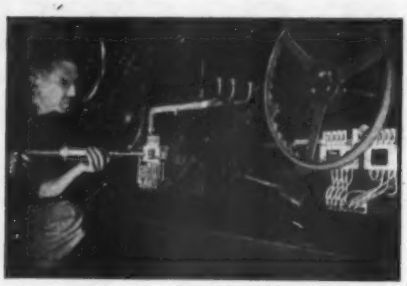


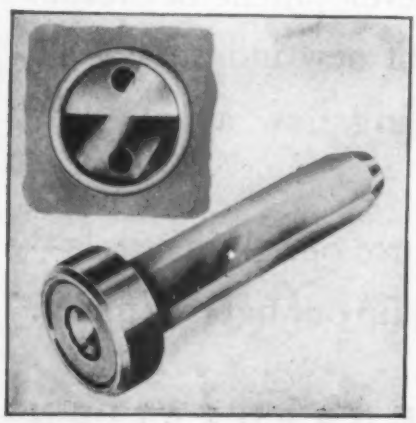
ANGLE DRIVE—*Payne Dean & Co., Laconia, N. H.* This universal angle drive has hand control for low-pressure valves up to 10 in. diameter. May 13, 1943, p. 144.



UNIT-SPRING—*Rande Specialty Co., P. O. Box 708, Hoboken, N. J.* This is a 9-cell spring for absorbing vibration or shocks and serves as a cushion in machine construction. Apr. 29, 1943, p. 132.

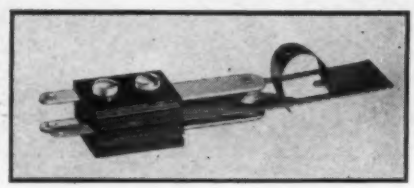


LUBRICATION SYSTEM — *Farval Corp., Cleveland, Ohio.* The Multival improved system provides for positive lubrication of bearings on machine tools and similar equipment. Sept. 2, 1943, p. 138.



OIL WINDOW UNIT — *Bijur Lubricating Corp., 2208 43 Ave., Long Island City, N. Y.* This is a plastic unit which gives clear oil level reading and is furnished in ⅝, 1¼ in. dia. sizes. Mar. 8, 1943, p. 124.

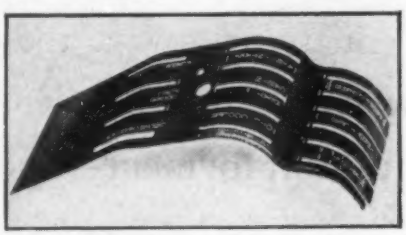
SWIVEL CASTER—*Rose Mfg. Co., 12400 Strathmoor, Detroit, Mich.* This is a heavy-duty all-steel unit featuring drop-forged baseplate with the king pin integral. Apr. 1, 1943, p. 126.



SWITCH—*Acro Electric Co., 1321 Superior Ave., Cleveland, Ohio.* This open blade snap-action switch has such applications as machine tool control, aircraft landing gear controls and relays and contactors. Oct. 14, 1943, p. 160.

COOLANT SPOUT—*J. N. Fauver Co., 49 W. Hancock Ave., Detroit, Mich.* It is adjustable for oil, air, water and steam and available from ⅛ to ¾ in. inside diameter. Not shown. June 24, 1943, p. 136.

WHEEL LOCK — *Streeter-Amet Co., 4101 Ravenswood Ave., Chicago, Ill.* Lok-Ons are mounted by unscrewing a lug nut or bolt from wheel; no key is required. Not shown. Mar. 4, 1943, p. 134.



PLASTIC—*Theodore Moss Co., 33 Flatbush Ave., Brooklyn, N. Y.* A method of fabricating plastic into cylindrical shapes and compound curves at low initial cost has been developed for such use as the plane panel shown. July 22, 1943, p. 132.

HIGH-SPEED STEEL—*Crucible Steel Co. of America, 405 Lexington Ave., New York, N. Y.* Rex MMM, molybdenum-tungsten-cobalt steel, is being produced with 5 percent more cobalt than Rex MM. This addition produces steel with superior hardness, resistance to abrasive wear and extreme red hardness. Not shown. Aug. 5, 1943, p. 140.

AMS 4640 BRONZE — *Ampco Metals Co., Inc., Milwaukee, Wis.* This high-iron, high-nickel aluminum bronze often used in aircraft production, is supplied in extruded sections in lengths up to 30 in. Not shown. May 27, 1943, p. 148.

HAND LIQUID—*Jones Medical Laboratory, Inc., 800 Huron Rd., Cleveland, Ohio.* Neo-Film is a protective coating to prevent industrial dermatitis. Not shown. July 22, 1943, p. 129.

TRACING CLOTH—*Frederick Post Co., Box 803, Chicago, Ill.* Whitex, an improved white pencil tracing cloth, is moisure-resistant on both sides. Not shown. July 22, 1943, p. 130.

ALLOY WOOD—*Pluswood, Inc., Oshkosh, Wis.* Among the many uses for Pluswood are for gears, bushings and tool handles. It is said that extreme temperatures do not affect this material and it is impervious to mild acids and does not support combustion. Not shown. July 8, 1943, p. 150.

BLACK FINISH—*Alrose Chemical Co., 180 Mill St., Cranston, R. I.* Oxidine finishes have been developed for black finishing various metals. Not shown. July 8, 1943, p. 144.

ADHESIVE COATING — *Nelson J. Quinn Co., Toledo, Ohio.* Bunatol protects sulphuric or chromic process anodizing racks, and does not become brittle, crack or peel when clips are flexed. Not shown. June 24, 1943, p. 126.

ZINC-PLATED STEEL — *American Nickeloid Co., Peru, Ill.* This is a substitute for performing the work of nickel, tin, aluminum, brass or copper. It is made in the form of sheets up to 36x96 in. in most gages, and in a full range of tempers. Not shown. June 24, 1943, p. 132.

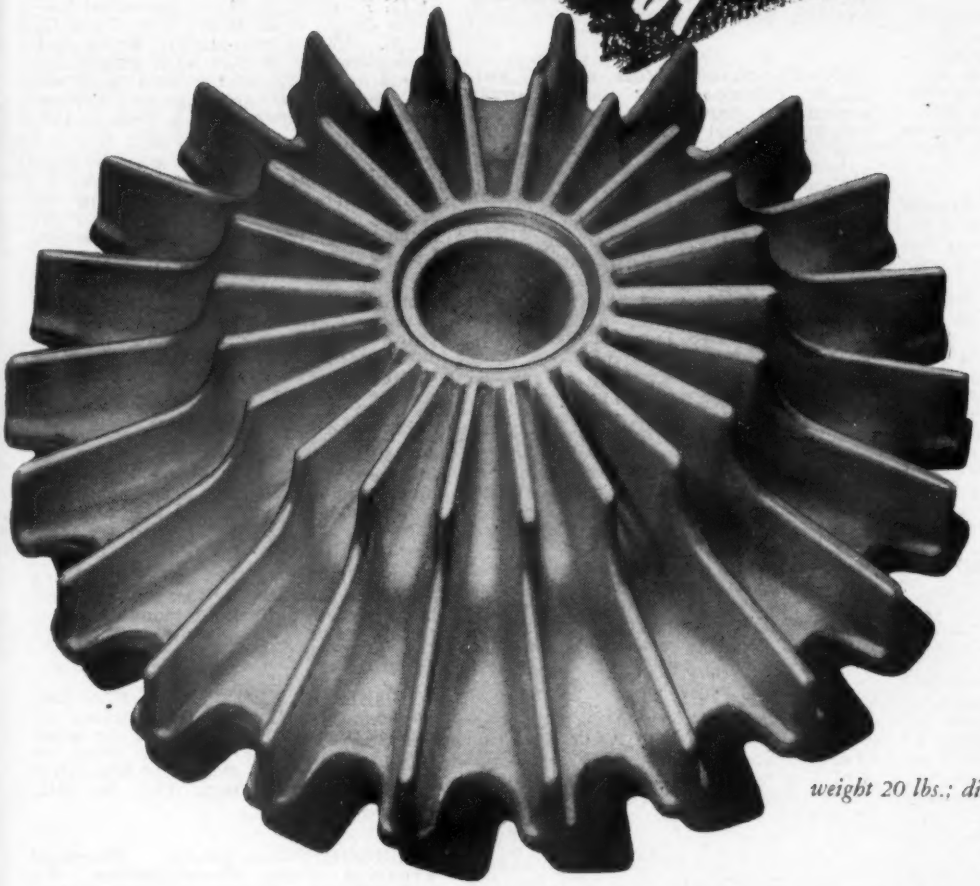
CUTTING OILS—*National Oil Products Co., Harrison, N. J.* This company has developed Vegicut A for light work on steel, all work on brass, copper, other non-ferrous metals; Vegicut B for aluminum alloys and magnesium. Vegisol is suited for steel and non-ferrous metals, while Vegisulph is for tough alloy machining. Not shown. June 24, 1943, p. 132.

HAND CREAM—*Dennis Chemical Co., 2701 Papin St., St. Louis, Mo.* Den-Tex cream compound removes paint and lacquer from the hand. Not shown. June 24, 1943, p. 128.

PAPER SEALERS—*Wayne Chemical Products Co., 9603 Copeland St., Detroit, Mich.* Protex paper sealer protects packages for export; requires heating from 150 to 160 F. to liquify for application. No. 8 Protex wax is a waterproof coating for dipping paper packages after wrapping. Not shown. June 24, 1943, p. 132.

WRINKLE FINISHES—*Maas & Waldstein Co., 438 Riverside Drive, Newark, N. J.* A full range of colors is available in the Victory wrinkle finishes which contain no Chinawood oil, but closely resemble the standard finishes. Not shown. June 24, 1943, p. 134.

ALUMINUM DIE-PRESSED FORGING by REVERE



weight 20 lbs.; diameter 10¾"

AN INTEGRAL PART OF A TURBO-SUPERCHARGER

The impeller illustrated above—when machined and in assembly—is destined to become an integral part of a Turbo-Supercharger.

It is typical of the strong, close-grained, intricate die-pressed aluminum forgings in which Revere has pioneered so successfully. Revere forgings are also available in copper, various copper-base alloys and magnesium. Almost any shapes and sizes can be had, even those ordinarily pronounced "impractical" or "impossible".

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ALKACITE LIQUID—*Protective Coatings, Inc., Box 56, Strathmoor Station, Detroit, Mich.* Type A Alkacite is a brush-on liquid for protection of metals, wood and concrete against corrosion. Not shown. June 24, 1943, p. 140.

LUBRICANT—*Doall Co., Des Plaines, Ill.* Saw Eez is offered to lubricate, reduce scoring and heating of saws. May also be used as lubricant on lathe centers, hacksaws, circular saws and other bearing surfaces. Not shown. June 10, 1943, p. 128.

METAL COATING COMPOUND—*Magnus Chemical Co., Garwood, N. J.* It is suited for coating metal preparatory to drawing, and is applied as a dip coating to high or low carbon steel wire, copper-coated wire and a stainless steel wire after pickling; replaces the usual lime coat. Not shown. June 10, 1943, p. 140.

IDENTIFICATION TAGS—*Hollywood Athletic Co., Plastic Div., 211 E. 7 St., Los Angeles, Calif.* This company has developed a line of plastic sealed armbands, identification badges, tool checks and similar identifying devices. Not shown. June 10, 1943, p. 134.

MOLDING POWDER—*E. I. du Pont de Nemours & Co., Wilmington, Del.* Lucite molding powder has been developed to make plastic articles that will withstand high temperatures; available in granular form for compression molding. Not shown. June 10, 1943, p. 132.

PULLEY LAGGING—*Victor Balata & Textile Belting Co., Easton, Pa.* Grip-on pulley lagging is suited for straight or crown face elevator, conveyor or power transmission pulleys; available in 2½ in. widths. Not shown. May 27, 1943, p. 142.

STEEL INK—*Doall Co., Des Plaines, Ill.* It is deep blue in color and used in layout work on dies, templets and machine parts. Not shown. May 27, 1943, p. 140.

BRAZING FLUX — *Scaife Co., Oakmont, Pa.* Scaiflux 21 is a silver-alloy brazing flux suited for use in any type of ferrous or non-ferrous alloy. It dissolves all oxides and protects cleaned surfaces from further oxidation. Not shown. May 27, 1943, p. 136.

FLUX—*Lloyd S. Johnson Co., 2241 Indiana Ave., Chicago, Ill.* Stainless steel can be soldered with this flux at low heat, also used for other metals except aluminum. Not shown. May 27, 1943, p. 146.

TANK LINING—*B. F. Goodrich Co., Akron, Ohio.* Koroseal lining is made in sheets that can be applied in thicknesses up to and including 3/32 in.; a synthetic elastic material. Not shown. May 27, 1943, p. 148.

EMELOID INSTRUMENTS—*Emeloid Co., 287-291 Laurel Ave., Arlington, N. J.* A wide range of instruments from slide rules to navigation calculating instruments is now available made of Emeloid which is a lightweight material. Not shown. Dec. 9, 1943, p. 128.

RESURFACING METAL—*Kerk-Aloy Co., Hollywood 28, Calif.* New and worn faces, edges and surfaces can be surfaced with Kerk-Aloy which is a hard overlay metal. Not shown. Dec. 23, 1943, p. 134.

RESURFACING MATERIAL — *Perfect Manufacturing Co., Cincinnati, Ohio.* Industrial So-Lo is suited for repairing breaks, burnt or worn spots, filling holes and for resurfacing belts. It is made with synthetic rubber. Not shown. Dec. 23, 1943, p. 136.

PROTECTIVE COATING — *Temmec Products Div., Porcelain Enamel & Mfg. Co., Eastern & Pemco Aves., Baltimore, Md.* Metlseel forms a protective coating for tools and parts subjected to high temperatures and cooling during heat-treating. Not shown. Dec. 23, 1943, p. 136.

CANVAS—*Burcott Mills, 616 W. Fulton St., Chicago 6, Ill.* Safety canvas provides a flameproof, weatherproof, waterproof and lightproof protection, and is available in most any size or specification. Not shown. Dec. 23, 1943, p. 135.

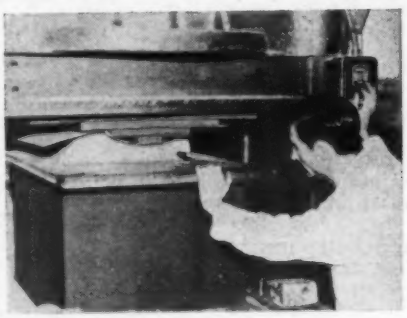
HARDENING SOLUTION — *Steeltem Chemical Co., 51 E. 42 St., New York, N. Y.* Steel-temp is used for hardening steel tools and parts; it works well with either water or oil quenching steels. Not shown. Dec. 23, 1943, p. 134.

WELDING LIQUID—*Midland Paint & Varnish Co., Cleveland, Ohio.* No-Spat welding fluid is a compounded mineral oil product of low surface tension for reducing welding fumes and vaporization of zinc on galvanized coatings. Not shown. Nov. 25, 1943, p. 138.

SYNTHETIC PLASTICS—*Resistoflex Corp., Belleville, N. J.* The compars group has been developed to meet demands for flexible material to handle solvents. Not shown. Nov. 25, 1943, p. 134.

ARC WELDING COMPOUND—*Protect-O-Metal Products, 79 S. Sperling Ave., Dayton, Ohio.* Protect-O-Metal No. 2, a creamy liquid, is available to prevent weld spattering when arc welding. Not shown. Nov. 25, 1943, p. 136.

COTTONLEATHER FABRIC—*Southern Friction Materials Co., Charlotte, N. C.* The material is suited for such applications as mountings for motors and radiators, shims for auto and truck bodies and as a leather substitute. Not shown. Nov. 25, 1943, p. 138.



RUBBER—*Los Angeles Standard Rubber Co., 1500 E. Gage St., Los Angeles, Calif.* X-84 rubber stock provides greatly increased service for hot magnesium forming sheets. Nov. 25, 1943, p. 136.

SILVER BABBITT—*National Bearing Metals Corp., 4930 Manchester Ave., St. Louis 10, Mo.* This material provides a substitute for tin-base babbitt and is said to have the same bondability and corrosion resistance. Not shown. Nov. 25, 1943, p. 138.

MOLDING POWDERS — *Rohm and Haas Co., 223 W. Washington Sq., Philadelphia, Pa.* Molding materials formerly called Crystalite are now known as Plexiglas molding powders. Not shown. Dec. 9, 1943, p. 130.

SKIN PROTECTOR—*Commercial Solvents Corp., 17 E. 42 St., New York 17, N. Y.* CSC is non-sticky, white and greaseless. It serves as a guard for hands and nails, and is said to eliminate permanent griming and grease stains. Not shown. Dec. 9, 1943, p. 128.

FLOOR PATCH—*Walter Maguire Co., 330 W. 42 St., New York 18, N. Y.* Emeri-Crete is used for filling in cracks, small depressions or other inequalities in concrete or cement floors. Not shown. Nov. 11, 1943, p. 134.

FLOOR PATCH—*Agatex Corp., 1170 Broadway, New York 1, N. Y.* Agapatch is a concrete floor patch for resurfacing holes and breaks which may be applied on wet or dry floors in any thickness from ½ in. Not shown. Oct. 28, 1943, p. 132.

PLASTICS—*Bakelite Corp., 30 E. 42 St., New York, N. Y.* Several phenolic molding plastics have been developed which save the supply of phenol. Not shown. Oct. 28, 1943, p. 132.

BUSHING CEMENT — *Allis-Chalmers Mfg. Co., Milwaukee, Wis.* Magna-Bond is a porcelain bushing cement which resists oil and water wear. Not shown. Oct. 14, 1943, p. 156.

SOLDERING FLUX—*Wolfe-Kote Co., Sheboygan, Wis.* Tri-Flux cleans, removes rust and fluxes all at the same time. It may be used for hand or torch soldering on steel, iron and other surfaces. Not shown. Oct. 14, 1943, p. 154.

MICROGRIND — *Quaker Chemical Products Corp., Conshohocken, Pa.* No. 132 can be used on all grinding, honing, lapping or super-finishing operations. This material is said to eliminate glazing and loading of abrasives. Not shown. Oct. 14, 1943, p. 145.

PLASTIC—*E. I. duPont de Nemours & Co., Wilmington, Del.* Many industrial uses are predicted for Polyvinyl alcohol resin plastic material when it is available for general use after the war. It is characterized by toughness and resistance to oil, grease and many solvents. Not shown. Oct. 14, 1943, p. 162.

FLOOR COMPOUND — *American Abrasive Metals Co., Irvington 11, N. J.* Absorb-Oyl has been developed for use where oil has accumulated on the floor. The material is non-abrasive, and prepared in small granular form packed in 50 lb. bags. Not shown. Oct. 14, 1943, p. 152.

PLASTIC—*American Pipe & Construction Co., P. O. Box 3428, Terminal Annex, Los Angeles, Calif.* Liquid plastic, known as Amercoat No. 33 is used for metal, concrete or wood. Not shown. Sept. 30, 1943, p. 128.

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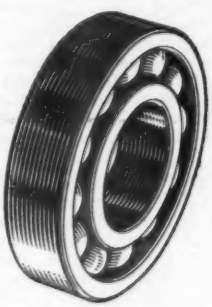

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DECALS—*Meyercord Co., Lake & Lorel Sts., Chicago, Ill.* Marproof, wear-resistant decalcomania nameplates for permanent application on raw, painted or crinkle-finished metal will be available for all industries after the war. Not shown. Sept. 30, 1943, p. 113.

GRINDING COMPOUND—*Wolfe-Kote Co., Sheboygan, Wis.* Ever-Drest material is said to lower surface tension of coolant when added to water for wet grinding operations. It is suited for organic and vitrified wheels. Not shown. Sept. 2, 1943, p. 128.

OIL COATING—*Rock-Tred Corp., 605 W. Washington Blvd., Chicago, Ill.* This material seals and covers surplus oil and grease which splashes onto machinery, floors and other places. Not shown. Sept. 2, 1943, p. 136.

PREGWOOD—*Formica Insulation Co., Cincinnati, Ohio.* This material, developed especially for airplane propellers to replace critical material, is built up from sheets of wood impregnated with phenolic resin. It will be available after the war for many other uses. Not shown. Aug. 19, 1943, p. 144.

WELDING ANTI-SPATTER — *Wolfe-Kote Co., Sheboygan, Wis.* Material marketed under the name of Anti-Spatter is offered for application to weld seams to prevent diffusion of spatter or molten metal to the surrounding surface of the weld. Not shown. Aug. 19, 1943, p. 138.

MOLDING MATERIAL — *Bakelite Corp., 30 E. 42 St., New York, N. Y.* BM-16468, a high impact-resistant material, is a black phenolic plastic having a stringer filler. Not shown. Aug. 19, 1943, p. 144.

RUST PREVENTIVE—*E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia, Pa.* Rust Veto 110A is a light amber-colored liquid which adheres to metal and dries in a thin glossy transparent film in a few minutes. Not shown. Sept. 16, 1943, p. 136.

PLASTIC — *Emeloid Co., 287 Laurel Ave., Arlington, N. J.* Emeloid plastic is available in clear or color, and can be formed, molded, cut, punched, stamped, drilled, machined, lithographed, and printed. Not shown. Sept. 16, 1943, p. 128.

PROTECTIVE COATINGS — *Insl-X Co., 857 Meeker Ave., Brooklyn, N. Y.* Compounds which air dry in 15 min. have been developed which can be stripped by hand without solvents. They cover properly on all finishes from rough to smooth and on complicated forms as well as edges. Not shown. Sept. 16, 1943, p. 138.

SOLVENT — *Michigan Chrome & Chemical Co., 6340 E. Jefferson Ave., Detroit, Mich.* Miccrostrip is useful for removal of protective coatings used to mask parts for hard chrome plating or for selective hardening. Not shown. Aug. 5, 1943, p. 134.

RESIN—*Durez Plastics & Chemicals, Inc., N. Tonawanda, N. Y.* By use of 7421 Durez liquid resin and addition of 7422 accelerator, a resin can be produced for low temperature casting. Not shown. Aug. 5, 1943, p. 142.

NYLON PLASTIC—*E. I. du Pont de Nemours & Co., Wilmington, Del.* Restricted to military use at this time, but available after the war, this material has a softening point of 450 F, particularly useful where thin sections with great strength are required. Not shown. Aug. 5, 1943, p. 140.

SOLDERING FLUID—*Lloyd S. Johnson Co., 2241 Indiana Ave., Chicago, Ill.* No. 6 non-acid soldering fluid is suited for deep-coated sheet metal, lead-coated sheet metal, tin plate, terne-plated, brass, copper, steel and all types of sweat fittings. Not shown. May 13, 1943, p. 151.

WRAPPING PAPER—*Sherman Paper Products, Inc., Newton Upper Falls, Mass.* Finished metal parts can be protected against corrosion with the V-26 greaseproof paper available with wax film or uncoated. Not shown. May 13, 1943, p. 150.

NAMEPLATES—*Meyercord Co., Lake & Lorel Sts., Chicago, Ill.* Type C open-letter design decal nameplate is suited for use on crinkle finish metal; supplied in non-metallic colors. The Type G is a background transfer design for crinkle finish and polished metal. Not shown. May 13, 1943, p. 150.

SKIN CREAM—*Alexite Engineering Co., Alexander Film Bldg., Colorado Springs, Colo.* Workers' skin is protected from danger of dermatitis by the use of a skin protector cream developed by this company. Not shown. May 13, 1943, p. 148.

SHEET STEEL — *American Rolling Mill Co., Middletown, Ohio.* Aluminized sheet steel has been developed for use in products requiring exceptional resistance to heat and corrosion. Not shown. April 1, 1943, p. 122.

PROTECTIVE BAG—*E. W. Twitchell, Packaging Div., 42 Public Ledger Bldg., Philadelphia, Pa.* This company has introduced a greaseproof and moistureproof bag for wrapping metal parts. Not shown. Apr. 1, 1943, p. 128.

STEEL WOOL—*American Steel Wool Mfg. Co., 42-26 Orchard St., Long Island City, N. Y.* Type A steel wool comes in ribbon form 4 in. wide, and is suited for cleaning and polishing. Not shown. Apr. 1, 1943, p. 128.

POWDER METALLURGY PARTS—*Keystone Carbon Co., 2056 State St., St. Mary's, Pa.* Small parts of iron such as cams, eccentric parts, leathers, rotors, and slide blocks of iron are being produced by this company by powder metallurgy. Not shown. Apr. 1, 1943, p. 128.

DRAWING COMPOUND — *Shell Oil Co., Inc., 50 West 50 St., New York, N. Y.* Shelldraw No. 151 is used for drawing steel cartridge cases and shell up to 2 in. At same speed as for brass. Not shown. Apr. 1, 1943, p. 118.

FREE-CUT INVAR—*Carpenter Steel Co., Reading, Pa.* Invar 36 is a free-machining grade said to have faster machining time than the regular Invar bar stock. Not shown. Apr. 1, 1943, p. 128.

MANGANESE ALLOY—*W. M. Chace Co., 1600 Beard Ave., Detroit, Mich.* No. 772 magnesium alloy suited for low temperature resistor applications is available in strip, rod or sheets. Not shown. Apr. 1, 1943, p. 128.

DURASHIELD PLASTIC — *Plastic Fabricators, Inc., 500 Sansome St., San Francisco, Calif.* This is a laminated plastic which serves as a substitute for brass, copper, or bronze for nameplates on machinery and metal equipment. Not shown. Mar. 18, 1943, p. 142.

PROTECTIVE COATING — *Michigan Chrome and Chemical Co., 6340 E. Jefferson Ave., Detroit, Mich.* Koilcote is used on heating coils in rustproofing system. Not shown. Mar. 4, 1943, p. 136.

CUTTING OIL—*Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.* This company has introduced a heavy-duty soluble cutting oil with anti-rust properties. Not shown. Mar. 4, 1943, p. 137.

CUTTING OILS—*Standard Oil Co. of Indiana, Chicago, Ill.* The Stanicut line of cutting oils is available in five grades. Not shown. Feb. 18, 1943, p. 154.

FLUX—*Park Stewart, 1005 Carbis St., Worthington, Pa.* Mag-Na-Flo flux is used for gas-welding of magnesium, whether sheet or extrusion. Not shown. Feb. 4, 1943, p. 130.

GREASEPROOF PAPER—*Dennison Mfg. Co., Framingham, Mass.* The No. 1A-35 wrapping paper has limpness and pliability of crepe paper. Not shown. Feb. 4, 1943, p. 130.

SKIN CREAM—*Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.* Fend industrial skin cream or lotion made by this company serves as a protection against dermatitis; non-clogging to pores and non-toxic; removes with soap and water. Not shown. Jan. 7, 1943, p. 124.

MASONRY LIQUID—*Evercrete Corp., 19 W. 44 St., New York, N. Y.* This is a transparent liquid for use on any type of masonry and said to be permanently dustproof and waterproof, as well as crumbleproof when applied to concrete. Not shown. Jan. 7, 1943, p. 124.

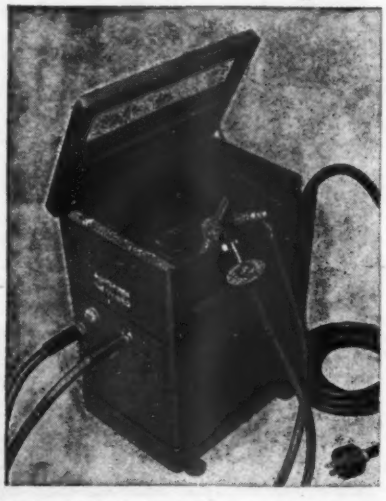
COATING—*Adhere, Inc., 1220 Maple Ave., Los Angeles, Calif.* Spraymask is a waterproof protective and abrasion-resistant mask for plastics; is applied with paint-spray gun, dries clear and transparent, peels off in a sheet. Not shown. Jan. 7, 1943, p. 126.

PLATING PROCESS—*Precision Paper Tube Co., Special Products Div., 2023 W. Charleston St., Chicago 47, Ill.* A process of plating plastics, glass or any non-conductor with any of the plating metals has been developed by this company. Not shown. Sept. 2, 1943, p. 130.

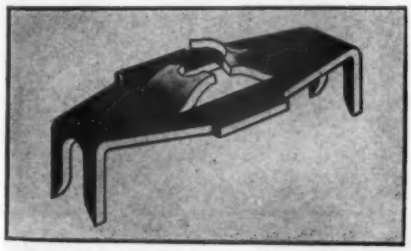
BONDING PROCESS—*U. S. Stoneware Co., Akron, Ohio.* The Reanite process is suited for bonding most metals and plastics to each other or to dissimilar materials. Not shown. Sept. 2, 1943, p. 142.

PARTS and MATERIALS
— Fastening Devices

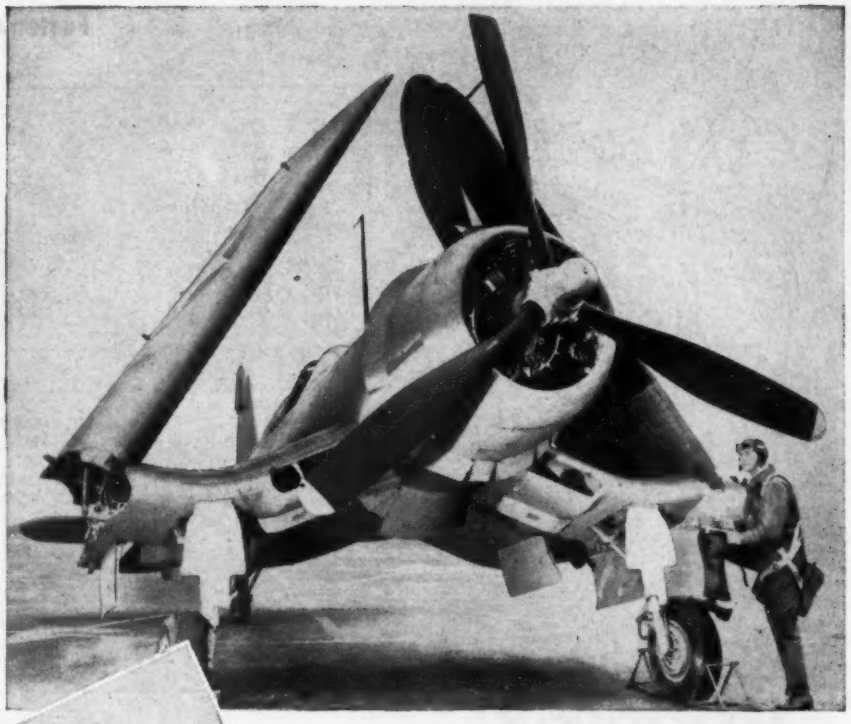
BLACKING PROCESS — *Mitchell-Bradford Chemical Co., 2446 Main St., Bridgeport, Conn.* Black-Magic, a low-temperature one-bath process, checks wear on gages. July 8, 1943, p. 136.

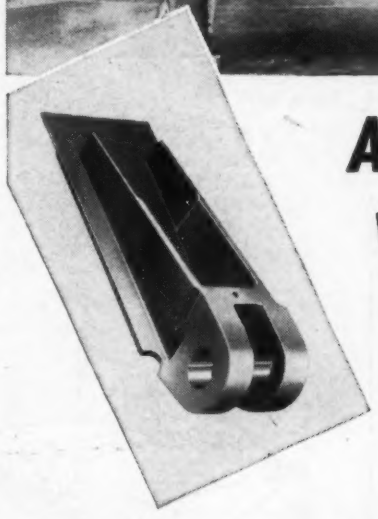


FUSE-BOND PROCESS — *Metallizing Engineering Co., 21-07 41 Ave., Long Island City, N. Y.* Machine components and similar metal parts can be prepared for metallizing electrically by this process. Illustrated is the Type C unit used in preparing the parts. Mar. 18, 1943, p. 134.



SPEED NUT — *Tinnerman Products Inc., 2102 Fulton Rd., Cleveland, Ohio.* This is a self-locking speed nut for use in holding together plywood parts. Feb. 18, 1943, p. 146.





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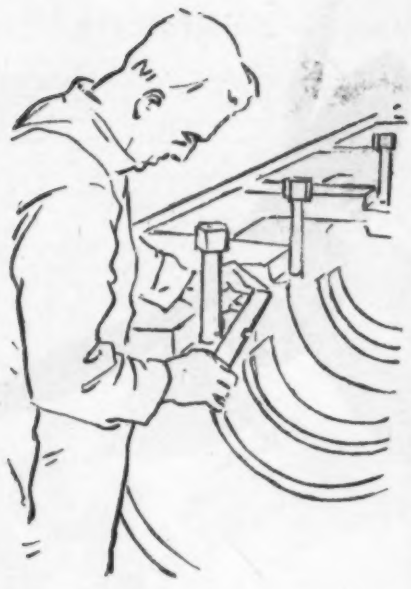

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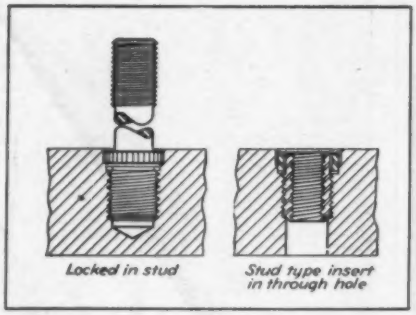
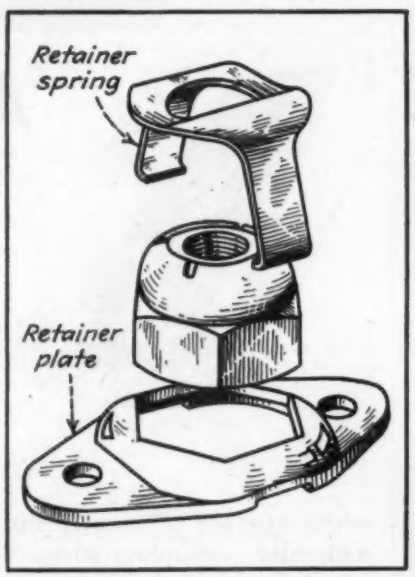


LOCKING UNIT—*Bardwell & McAlister, Inc., Hollywood, Calif.* The Rosan locking system employs serrated stud and ring and adaptable to functions performed by ordinary studs and inserts. Mar. 4, 1943, p. 128.

SELF-LOCKING NUT — *Edward F. Chandler, 535 Fifth Ave., New York, N. Y.* This unit features a nut which locks onto the bolt at any point. Not shown. Mar. 18, 1943, p. 130.

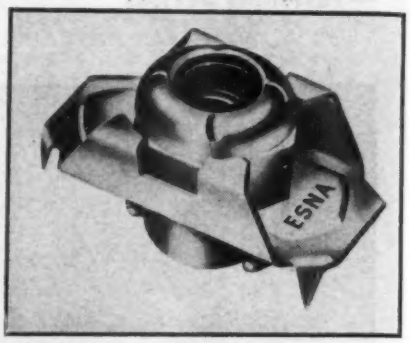


NUT & BOLT RETAINER—*Kaynar Mfg. Co., Los Angeles, Calif.* Click retainer is adaptable to any aircraft, marine or ordnance nut or bolt, and is interchangeable with other anchor fittings. Nov. 11, 1943, p. 138.

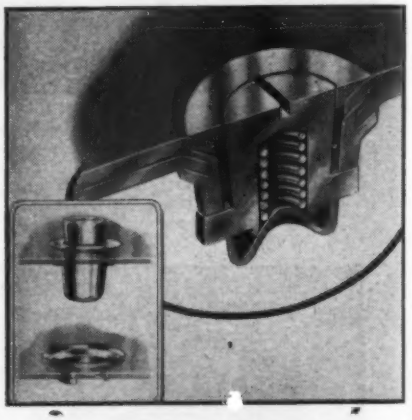
WIRE FITTINGS — *Wiremold Co., Hartford, Conn.* For bench wiring service, the company has developed Wiremold No. 3046A fittings to take the 20 amp. twistlock type receptacle when mounted with Wiremold No. 3,000. Not shown. Oct. 28, 1943, p. 122.

HOSE CLAMP — *Aircraft Standard Parts Co., 1711 Nineteenth Ave., Rockford, Ill.* Two models of Aero-Seal line of clamps are available for hose sizes of ¼, ⅜, ½ in. and ⅝ and ¾ in. Not shown. Nov. 11, 1943, p. 136.

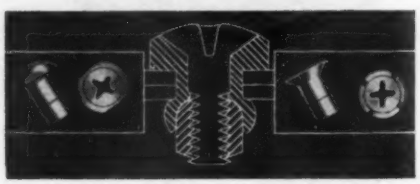
SILVER-FINISH HARDENING—*Perfection Tool & Metal Heat-Treating Co., 1740-58 W. Hubbard St., Chicago, Ill.* Hardening without discoloration is provided by the Silver-Finish hardening process developed by this company. Material is suited for any tool steel or alloy whose hardening temperature is less than 1,900 F. Not shown. June 24, 1943, p. 138.



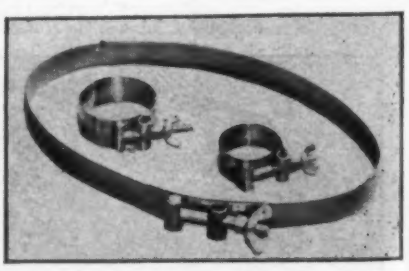
FASTENING DEVICE — *Elastic Stop Nut Corp. of America, 2332 Vauxhall Rd., Union, N. J.* This self-locking device has been developed for use on plywood. Aug. 19, 1943, p. 142.



FASTENER—*Simmons Machine Tool Corp., Albany, N. Y.* The Simlok fastener for aircraft cowlings, inspection plates, protective panels and similar uses, features a helical type spring. Oct. 14, 1943, p. 158.

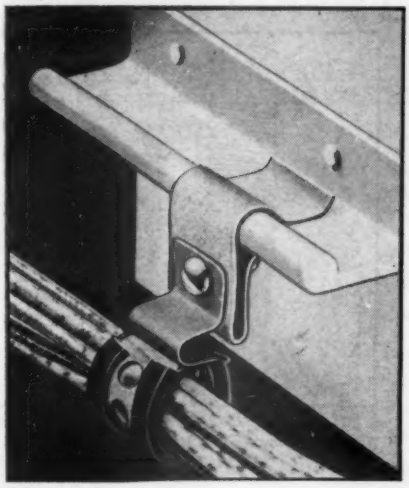


BLIND RIVET — *Pacific Railway Equipment Co., 960 E. 61 St., Los Angeles, Calif.* The Preco rivet is available in raised and flush head types, each in three diameters, ⅛, 5/32 and 3/16 in. Oct. 14, 1943, p. 152.

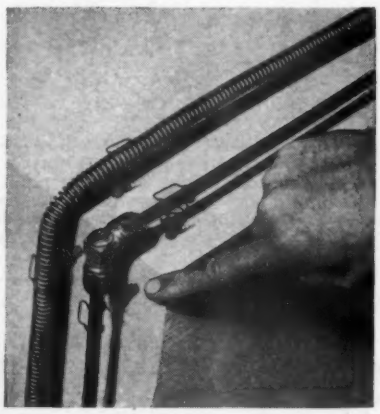


CLAMP—*Marman Products Co., Inglewood, Calif.* This is a light-weight air and oil duct clamp for high-pressure hot or cold installation for aircraft, automotive engine assembly. Mar. 18, 1943, p. 138.

PARTS and MATERIALS — Fastening Devices

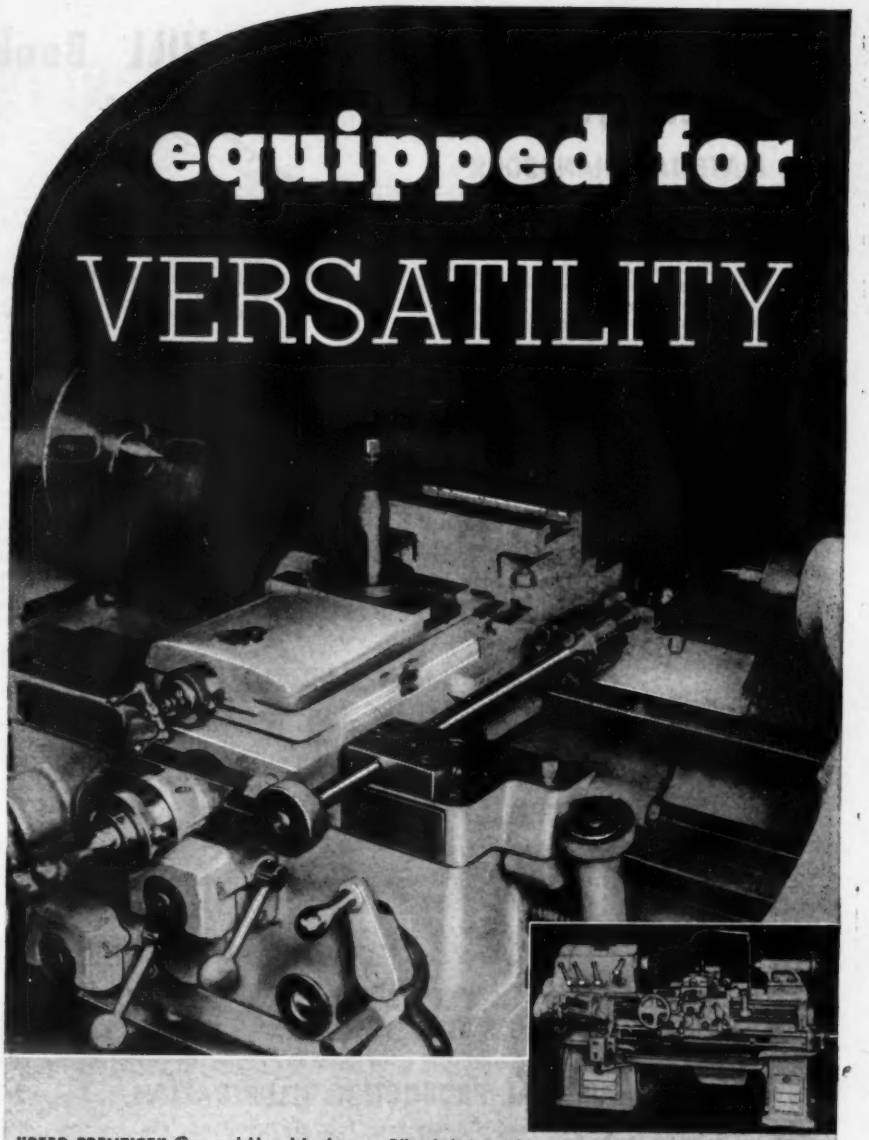


WIRING CLAMP — *Tinnerman Products, Inc., 2102 Fulton Rd., Cleveland, Ohio.* For use in other equipment as well as aircraft, this wiring harness clamp provides independent wiring hold for bundles from 1/16 to 1⅝ in. in diameter. Aug. 19, 1943, p. 130.



FASTENER—*Packless Metal Products Corp., New Rochelle, N. Y.* This is a flexible device which has combined functions of a supporting strap and vibration absorber for stationary or movable tubing. Oct. 14, 1943, p. 152.

TOGGLE CLAMP — *Knu-Vise, Inc., 16891 Hamilton Ave., Detroit, Mich.* This is a horizontal type clamp which has a U-shaped bar, which permits clamping material of varied thicknesses. Oct. 14, 1943, p. 160.



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Simplified so that it can be easily understood by anyone entirely unfamiliar with shop production methods, the material in this book covers every detailed phase of time study on the basis of specific machine studies. Each time study shown is taken from actual industrial observation. Shop production methods, machinery and tools are completely explained as well as the step-by-step study that should be taken on particular operations. By William H. Schutt, 426 pages, $5.00.

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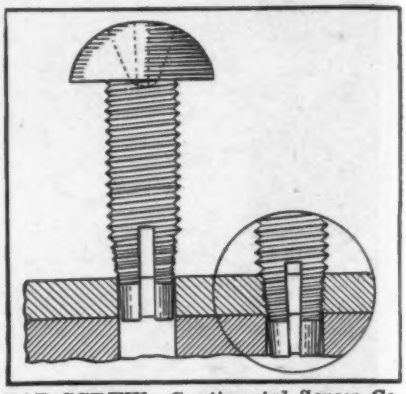
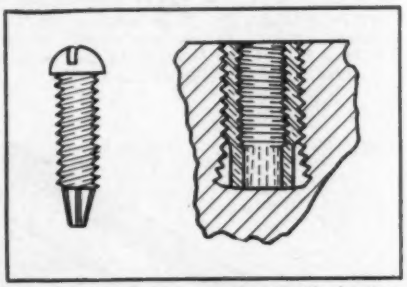
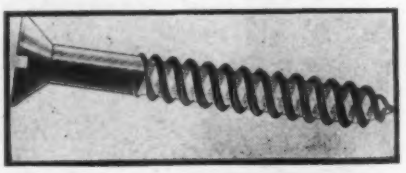


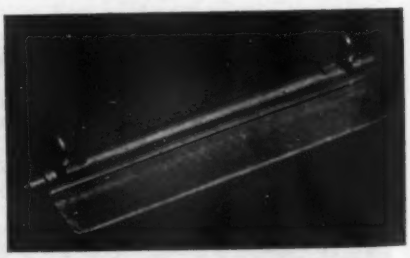
TAP SCREW—*Continental Screw Co., New Bedford, Mass.* A slotted opening is provided at entering end of screw which produces a self-cutting edge. It is suited for metal or plastic. June 24, 1943, p. 138.



INSERTS — *Marco Co., Wilmington, Del.* For materials such as plastics, fibers, copper, other metals, this insert provides holding by special threading at the bottom. June 24, 1943, p. 136.



SCREW—*Blake & Johnson Co., Waterville, Conn.* The Twin-Fast screw suited for plastic and combination assembly is shaped for tight holding. June 24, 1943, p. 136.



HINGE—*Burklyn Co., 3429 Glendale Blvd., Los Angeles, Calif.* The unit is suited for application on machines and other types of equipment; lengths range from 2 to 6 in. July 22, 1943, p. 134.

SCREW—*United Screw and Bolt Corp., 2500 W. Cullerton Ave., Chicago, Ill.* Clutch Head screws feature a recessed head for operation with assembly bit or standard screwdriver. Not shown. Aug. 5, 1943, p. 138.

Gaging Business

Allowing for recent cuts, the 1944 munitions program stands at $71,000,000,000 now as against 1943's $61,000,000,000. But this will be slashed if the European War should end suddenly. When the Nazis surrender the decline in the plane program alone would reduce the over-all munitions total by at least $3,500,000,000. Almost all other items, except landing barges, would be cut also.

December airplane output of 8,802 was disappointing in numbers, but was favorable in other respects. Total weight of planes produced was 5 percent above the November total, meaning that more big planes are being produced in relation to the total month by month. For example, a new record of 1,200 heavy bombers was made in November, while certain other highly desirable models came through on or ahead of schedules.

Meanwhile, munitions cutbacks will permit steadily increasing output of durable consumers goods. Next on the list will be 1,000,000 washing machines for the 12-month period ending June 30, 1945. Plan will be along lines of the electric iron program with each manufacturer receiving a quota based upon production in the 12-month period ending June 30, 1941. Manufacturers may assign their quotas to others, if war work prevents fulfillment of such quotas. Electric refrigerators will follow shortly after.

The easing of steel has resulted in a study being made of steel expansion programs to determine the feasibility of halting work on incompleted projects at the most practical point. Four groups of new facilities have been canceled thus far, including cooling-beds, hot-topping and slow-cooling equipment.

Loss of profitable alloy business and other favorable profit margin orders was putting the steel industry into the "red column" before the CIO demanded its latest wage increase. Whether or not higher wages are granted, the industry will need price relief unless its "product mix" changes.

Top premium prices to marginal miners of copper and zinc are no longer being paid in view of the easier situation in both metals. Import quotas will be cut soon. Aluminum is so easy that 20 operating pot-lines will be shut down in coming months; only four have been shut down thus far, plus the halting of work on new facilities.

A new drive is being launched to break component bottlenecks tieing up the truck, farm equipment, and construction machinery programs. New WPB officials assigned to the task express confidence in meeting the 1,000,000 truck goal for 1944. The Army has reduced its spare parts requirements, but it still has not made available to manufacturers its large hoard of truck parts.

But Washington says that facilities cannot be released to turn out many replacement parts for civilian trucks and passenger cars. Such sources believe that a 1944 output of $400,000,000 for civilian use is possible barring strikes, but Detroit experts think that $500,000,000 is more likely.

At the year-end, the government owned $155,000,000 in machine tool and metalworking plants and equipment, plus $475,000,000 in machinery and electrical equipment plants and partial installations. This does not include the billions of dollars of machine tools and machinery owned by the government but installed in munitions plants, aircraft plants, shipyards, and so on.

Surplus Used Equipment Moving Steadily to Purchasers

But slight restrictions surround sales to producers, and those are expected soon to be removed. Services cautiously withhold equipment for which invasion may create need

WASHINGTON—A check with major government agencies disclosed that the bulk of used equipment being liquidated is moving without priorities, except for a few items such as compressors, and commercial sewing equipment. Moreover, such limited controls as now exist probably will be entirely removed very soon.

One such curb requires that the purchaser of second-hand equipment which has not been operated at all by the first buyer must provide a priority at least as high as the original purchaser. This restriction will shortly be removed, and may ease the sale of some government-owned machine tools now in storage.

A major potential restriction on sales of used equipment, although seldom exercised, has been the privilege of the WPB Tools Division to divert particular items to purchasers holding high priorities in certain cases where more than one buyer is trying to secure the same item. However, it is reported that very few such instances have occurred. In effect, this limitation is practically no handicap to the purchasers of used equipment.

Uncertainty Stops Sales

Equipment owned by the armed forces and made idle by cut-backs and cancellations in contracts is growing in volume, but the services hesitate to include much of it in their "surplus" categories for fear that need for such machines might develop in case of a change in the military program. It is emphasized that while cut-backs have been given wide publicity, increases in various programs are usually surrounded by secrecy. Thus, the services have been able to make many transfers from one agency to another of federal-owned machine tools and other equipment. It is unlikely that this care will be relaxed until the experience of the "shooting war" growing out of the Allied invasion of the Continent from the north enables the services to be more sure about what equipment they are unlikely to need.

Foreign Sales a Factor

On the selling end, liquidations of government-owned equipment have been running at the rate of about $5,000,000 weekly. Washing machine manufacturers are reported to have taken up a sizable number of used machines to round out their facilities preparatory to the scheduled resumption of washing-machine production in the second half of 1944. Moreover, many foreign purchasers have entered the market in recent weeks, and the volume of requests for export licenses for used equipment has risen steadily.

Baruch Termination Plan Ordered for all Agencies

WASHINGTON—Bernard M. Baruch, head of the War and Post-War Adjustment Advisory unit in the office of War Mobilization Director James F. Byrnes, announced on January 8 the development of a contract termination clause and statement of cost principles expected to reduce litigation. The termination plan would allow contractors the contract price on completed work, a 6 percent maximum on work-in-process, and a 2 percent maximum on unprocessed inventory, in cases where the contractor and contracting officer fail to agree on settlement of the claim.

Developed only two months after Baruch was assigned to his over-all postwar tasks, the uniform termination clause was made effective immediately by a directive by Byrnes to all procurement agencies. It will be inserted in new contracts and will be added to existing contracts, as soon as possible. Byrnes characterized the clause as an important step in eliminating delay in payment of cancelled war contractors. Up to this time, contracting agencies have squabbled over this matter for a year and a half.

However, a joint statement by Baruch and John Hancock, his assistant pointed out that this provision did not cover such vital matters as "payments and loans, settlement procedures, keeping of adequate records and protecting the public against fraud, problems of subcontractors, appeals, company-wide settlements and property disposal."

Baruch indicated that plans are underway to extend the same principles of contract settlement to subcontractors, and to develop a method for quick payment of cancellation claims to ward off unemployment and inflation. He further indicated plans to assure clearance of government-owned materials and equipment from the plants of cancelled contractors not later than sixty days after the filing of inventory lists by the contractor.

COMPONENT CONVERSION UP

NEW YORK—Though machine tool builders are getting a fair amount of machine tool business, they are taking on an increasing amount of subcontract work, particularly in connection with the motor truck components program and with production of bearings. The dollar volume this year of machine tool and non-machine-tool business promises to be in excess of $500,000,000 and may reach $700,000,000, compared with $1,180,000,000 of machine tools alone in 1943. WPB is reported stiffening its attitude against early granting of priorities to the industry to make machine tools for automobile companies. While machine tool builders are not permitted to ship new machines to Latin America for non-war use, the British are busy there taking orders for early delivery.

Garand Grenade Launcher—Though experts said it was impossible, Ray S. Miller, right, civilian armament foreman, post ordnance shop, Fort Benning, and Col. C. H. Coates, Infantry Board, invented a means of launching grenades from the Garand rifle. This development eliminates need for '03 rifles for this purpose. Mr. Miller is shown fitting one of the launchers to a Garand

International

Inside Detroit

Easing of government restrictions to allow limited working on cars is predicted, on the basis of the daily "junk" rate. Partial conversion will present problems of available space and of subcontractors. Plans being laid for any type conversion

BY SILER FREEMAN

Auto Makers See A Spring Thaw The automotive industry is talking confidently that by spring of this year, the green light will flash for the plants to start going back to peacetime production. Not that cars will flow out of hastily thrown together production lines at once or even in three months, but the heavy hand of government will be slightly lifted to let them begin working on cars on a limited basis.

Because the nod to resume partial production of cars would not bring any change in the controlled materials plan, it would mean that at least six months would elapse before there would be any production whatsoever and then just a trickle. The estimates of all the "brass hats" on when they could start turning out cars were all predicated on "ideal" conditions and the conditions under which partial production will be resumed will be far from ideal, all admit.

The March 1 date was hazarded by the head of one of the large independents. He refused to lend his name to the prediction, which was given at an "off-the-record" press conference. But without using his name, the prediction was given circulation in two daily papers.

Estimate Is Well Based The basis for this official's prediction is sound. Cars are going off the road at the rate of 4,600 a day. It has been estimated that there are between 21,000,000 and 23,000,000 autos still doing duty in the country and the "death rate" is increasing. By the end of 1944, car transportation will have passed the danger point set out in the Brookings Institute report, of 20,000,000 cars as a minimum.

It will be so critical, auto executives believe, as to threaten the war effort at its most critical stage. This was the subject of a recent conference between War Production Board officials and auto men in Washington. It is on this meeting's discussions that the March 1 date was picked for the flashing of the "go" signal to manufacture cars.

ACWP Asked WPB Ease Materials This executive is not the only one who believes that the time is very near when car manufacture will be resumed. It is known that the Automotive Council for War Production, without specifically asking that the car makers be allowed to go back to their old business, recently asked the WPB to set up a formula when and if the time was ripe for it. It asked that all releases of materials, either for experimental work or for resumption of partial production, be done on an industry-wide basis and that releases be made to all simultaneously and quotas be allocated based on each manufacturer's automobile production for a four-year average prior to the war.

But Some Lack Plant Space While this would make an equitable basis for partial resumption, as well as experimental work, there has been no solution offered yet to the plight of a few manufacturers who have gone so all out in their war work, that they are right up against it for plant capacity, to say nothing of manpower. A good example of this is Packard, which is loaded to the top with Rolls-Royce and marine engines.

Even with the war in Europe ended, the demand for Packard's products would most likely not be diminished. It has added buildings and with 36,000 persons on its pay rolls, it would not have any space nor any manpower to give to automobile manufacture.

That does not discourage George T. Christopher, the energetic president of Packard. "We'll be in competition with the others whenever we get the 'go' signal," he said. "Maybe we wouldn't be able to do it in Detroit but we'd be building cars, too."

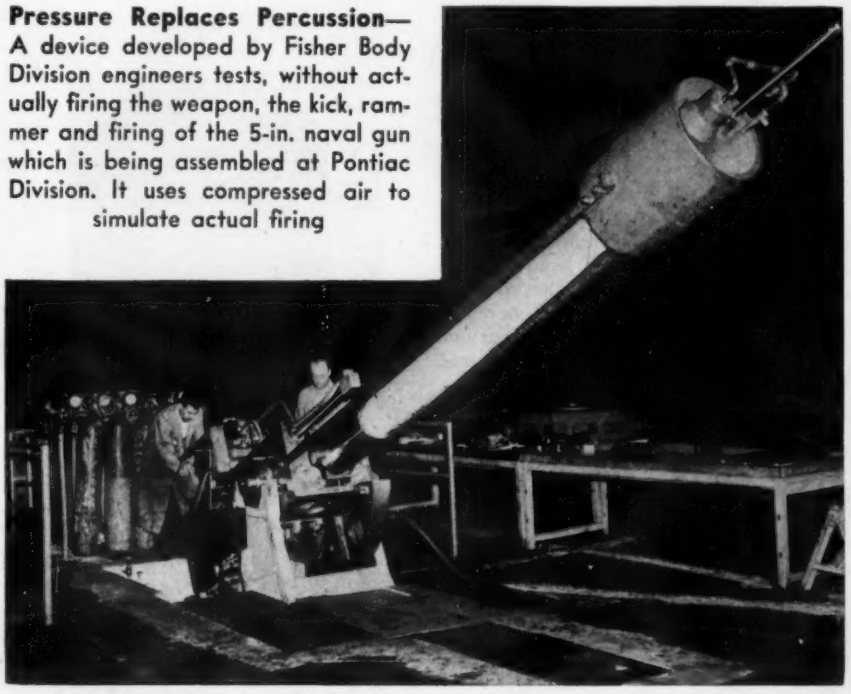
Packard Plans For Equipment Packard, like the other automotive companies, has big plans for new equipment. The company will spend about $10,000,000 of which $6,500,000 will be for machines and tools. The company is planning a 65-car-a-day production schedule, against a top of 45 before the war.

Christopher estimated that his company could start car manufacture in four months, providing that the unusable government machinery could be cleared out from the plant and materials made available.

While hints are thrown out that the WPB may relent soon, the industry is making plans, on paper and otherwise, for any contingency that may come along. Many plants have layouts for partial or full resumption.

Plan Partial Reconversion Companies with varied contracts are planning ahead to concentrate the ones which will be unaffected by Hitler's defeat to leave plant space for partial operations on car manufacture. But one thing that none is overlooking is how his suppliers and subcontractors will fare by a turn in the global war.

Pressure Replaces Percussion— A device developed by Fisher Body Division engineers tests, without actually firing the weapon, the kick, rammer and firing of the 5-in. naval gun which is being assembled at Pontiac Division. It uses compressed air to simulate actual firing



Auto Makers Hire Ex-Service Men, Lay Plans to Hire More

DETROIT—The automotive industry has begun its first job of reconversion—the gigantic task of fitting returning service men and women back into jobs. Some companies have proclaimed special programs, set up separate departments and assigned experts to rehabilitate and retrain them.

Leading in the program of rehabilitation and retraining is the vast General Motors Corp., with a general program recently announced by Vice President Harry M. Anderson, in charge of labor relations. The program calls for: the coordination of the medical, employment, educational and supervisory departments; a survey, plant by plant, of jobs from the standpoint of physical requirements to determine their suitability in relation to physical handicaps; cooperation with the regional offices of the Veterans Administration in the cases where the veterans are temporarily unable to work because of physical or mental conditions requiring extensive care.

General Motors has rehired about 8,000 former service men. Of this number, less than half are former employees. Current hiring of veterans is about 1,500 a month.

Draws on Experience

Ford has 807 veterans on its payrolls, of whom 722 were discharged from camps in the United States, 85 from active combat zones. Placement work is done through Ford's medical transfer department. The company has always had a policy of hiring about ten percent of its workers from the ranks of the disabled.

Veterans with medical discharges are divided into two groups by Ford: Inactive—those who have not had overseas duty, and active—those with overseas service. The first group presents little problems, except those with gastro-intestinal ailments who may require extra time off for special foods or medicines. But the second group must be carefully handled.

This department consists of ten employes. Two men and a woman roam the plants, looking for special jobs available for handicapped persons.

Chrysler, also, hires returned service men through regular channels and follows them up to make sure that they are placed in proper jobs. Packard has assigned George Hunt as a special consultant to returning veterans. Hiring is done at special windows set up in the employment office. About 300 ex-service men are now on its payrolls.

Briggs, Hudson, Murray and the smaller plants have similar programs, and are rehiring all the service men who apply. The experience of all the companies is that the ex-service men have made the most valuable workers, have a greater sense of responsibility and are good producers.

There are, of course, exceptions. The case histories kept by Eastern Aircraft show that some misfits discharged by the Army are still misfits in the plants: they have the "world owes me a living" philosophy.

But in the main the service men are working out satisfactorily, and intelligent handling and cooperation between departments is overcoming many obstacles to rehabilitation.

British Sell Cash-Purchased Tools Upon Release by U. S.

WASHINGTON——In denying that it was dumping on the market a large quantity of its machine tool holdings in the United States, the British Government, through its Information Service here, outlined what has happened to its total U. S. tool purchase of $380,000,000 for cash and $120,000,000 under lend-lease. Of this, the entire lend-lease acquisition has been shipped to the United Kingdom, along with about $260,000,000 of its cash tool purchases.

The $120,000,000 in machine tools comprising the balance, largely represents the equipment originally used to increase U. S. munitions-producing facilities to meet British contracts prior to the U. S. entry into the war. Of this amount, about $60,000,000 worth was sold to the U. S. government outright, with the balance leased by the U. S. government mostly on a $1-per-year basis, under "follow-on" contracts. However, about $50,000,000 worth of this equipment is still owned by the United Kingdom and may be disposed upon release by the U. S. government, and could be sold in the American market.

The British have already disposed of about $6,000,000 of these tools upon release, with $2,000,000 going to Russia and the balance to the American tool market. On January 1, 1944, its list of tools available for sale approximated $204,000, reported to be half of the original cost of the equipment offered. Other equipment will be offered as it is released, and all such tools will be regularly reported to the Available Tools Section of the War Production Board. However, some American plants have option to purchase the British tools in their plants at prices well below cost, and some of these options have already been exercised.

SAY MARITIME HOARDS STEEL

WASHINGTON — Several checkups are reported to be underway into the Maritime Commission's scheduling of materials. The Commission has often been charged with asking for more steel plate than it turns out in the form of ship launchings. It is reported that it now has 2,500,000 tons of steel plate, the most critical item in the steel situation.

Since the Maritime Commission is scheduled to receive an additional 3,300,000 tons during the 1944 first-half, the combined total is reported to be sufficient for its entire year's ship program. However, cut-backs at the end of the European War would leave Maritime with enormous surpluses of steel plate.

Honored by Army Ordnance Association

Medalists—Maj. Gen. L. H. Campbell, Jr., chief of ordnance, USA, Tom M. Girdler, chairman, Republic Steel Corp., l. to r., and Rear Adm. W. H. P. Blandy, next page, chief of Bureau of Ordnance, USN, were awarded the Army Ordnance Association's gold medals for distinguished ordnance service at the organization's 25th anniversary meeting at the Waldorf-Astoria, New York, January 20

Wartime Washington

WPB adopts cautious approach to material control easing. Idleness for material producers is seen. Services fear overconfidence if production of auto tools is allowed now. Postwar international trade problems are now being considered

Materials Ease, Controls go on The War Production Board is beginning to formulate basic policies to reduce gradually the wartime restrictions necessitated by limited supplies of raw materials. But despite current and near-future surpluses of such materials, controls will not be immediately removed in the near future. Various limitation orders probably will be amended to permit resumed manufacture of non-essential types of products, and materials allocated against such use.

WPB does "not want to endanger the war effort" by suddenly lifting controls, only to learn later that there is not enough raw material for vital war needs. Some observers believe that WPB could revert to its priority system in lieu of CMP controls and still protect war requirements.

Shift Will Bring Idleness Metal producing facilities probably will be forced into idleness in coming months due to the inability of shifting WPB controls fast enough to take up the slack caused by cancelled orders. At the other end of the national economy, metal-consuming industries face an enforced period of idleness in reconversion for similar reasons.

Services Against Auto Tooling Now The Army and Navy oppose the granting of priorities to the machine tool industry for auto industry business, even though WPB favors the move. The military services contend that it would contribute further to public overconfidence. The recent steel strike and the threatened railroad strike seem to support such fears.

The steel strike cost the nation thousands of tons of steel plate, which probably held up some construction of landing barges. Meanwhile, the taking over of the railroads by Army officials removes these men from duties in connection with the foreign fighting. Thus, these two conditions brought about by organized labor apparently "delayed the invasion of Europe, and probably cost the lives of thousands of American fighting men," as was expressed by a leading military official.

Unions Flatly Refute Claim Labor says the charge is "irrational, uninformed and inflammatory." Yet it is hard for Washington observers to see how labor's action on the verge of the planned large-scale invasion of Europe "helped" the war, so far as the German will to resist is concerned.

New Navy Ordnance Chief

Rear Admiral G. F. Hussey

Rear Admiral W. H. P. Blandy

Rear Admiral G. F. Hussey, Jr., upper, took oath as chief of Navy Bureau of Ordnance, recently, succeeding Rear Admiral W. H. P. Blandy, lower, who has gone to sea on active duty. In naval service since 1916, Rear Admiral Hussey has had considerable ordnance experience between tours of active sea duty

Release Foreign Trade "Balloon" A "preliminary feeler" of Administration plans for postwar international trade was believed to have been reflected in a January 5th speech by WPB Vice Chairman William Batt before the Chicago Association of Commerce. He pointed out that we could not be paid in cash by foreign nations for their purchases, and that it thus would be necessary to accept foreign goods in return for U. S. goods shipped abroad. Such imports naturally would include products in quantities beyond American requirements; he proposed that surpluses be "frozen" for a national emergency.

Meanwhile, the United States would continue a "limited production of our own natural resources," he suggested, indicating that domestic production of some items may be curtailed in the interests of national defense of foreign trade, while foreign supplies would be imported for some current consumption and for stockpiling. He pointed out that this policy would postpone the exhaustion of our natural resources.

Fear Huge Stockpile Conceding certain merits to this theory, some observers point out that a few years of imports of foreign surpluses in certain commodities would create such a huge stockpile that no further imports would then be necessary. Some observers believe that the only possible consequence would be that the United States might become a clearing-house for foreign goods and commodities.

Fundamentally, the policy outlined by Batt would require large Federal subsidy of United States international trade. Even so, United States industry would have more support in foreign markets than it has ever before received from the government, and Mr. Batt indicated this as one of the nation's postwar requirements in international trade.

These developments indicate that the administration continues to move warily on the path of reconversion. Most of its major plans will be preceded by "trial balloons" or guinea-pig experiments, subject to amendment or correction according to general reaction. Such a step was the recent program permitting resumed production of 2,000,000 irons, with each manufacturer being assigned a quota of the total, and able to assign it to some other manufacturer in cases where plants were not free to do the work.

Industry Supports Art—To pay the prize award and cost of the mural competition of the Springfield Museum of Fine Arts, the Van Norman Company presented $5000. Shown, above, left to right, during the presentation ceremonies at a Springfield Rotary Club luncheon, are Dr. John Birnie, club president, Charles Van Norman, board chairman, Van Norman Company, F. B. Robinson, Museum director and Rotary member, who presided, Dr. W. B. Kirkham, museum trustees president, and Pfc. Sante Graziani, award winner

Over Supply of Parts Cuts Aircraft Engine Production

NEW YORK—One factor contributing to the recent cut-back in aircraft engine production is the alleged oversupply of spare parts in Air Force depots. In addition to slashing engine production, procurement officers have been cutting the spare parts program, starting first with the high cost subassemblies and working their way down the list. Manufacturers' arrearages on spare parts have also been concelled. When the cuts in engine production, regular spares and cancellation of arrearages are lumped together, some plants will probably need about one-half the productive labor they employed in November.

Some of the smaller items an engine manufacturer is called upon to make run into millions of pieces, requiring small size industries in themselves. Arrearages as of a recent date amounted to about half total orders, and even though production was then sufficient to equip several thousand engines monthly. Obviously the arrearage on an item like this would be cancelled. The spare parts question has been one that has been plaguing war contractors because, while they had to tool up and train labor for demands made by the services, they realized that a day of reckoning could not be delayed indefinitely.

Mark 75th Anniversary

ROCHESTER — Employees of the Gleason Works recently honored President James E. Gleason's 75th birthday anniversary at a ceremony held in the plant, here. Schuyler H. Earl, works manager, presented to Mr. Gleason an album containing the signatures of more than two-thousand employees, along with the gold pen they had used, and a matching pencil. Music was furnished by the Rochester Civic Orchestra. E. Blakeney Gleason, son of James E. Gleason and vice president and general manager of the Works, acted as chairman.

James E. Gleason

A Lifetime in Industry

Mr. Gleason has been active in the development and production of new types of gears and of bevel gear producing machinery since he returned from his studies at Cornell University to work with his father on the designing and building of lathes and planers manufactured by the Gleason Tool Company.

Truck Orders Drop

CHICAGO—Domestic bookings of electrical industrial trucks and tractors during October totalled 402 units, reports the Industrial Truck Statistical Association. The net value of chasses only booked during October totalled $1,896,921.20 compared with $3,943,962.40 in September.

BUSINESS ITEMS

International Detrola Corp., New York, N. Y., has been formed as the result of a merger of **International Machine Tool Corp. and Detrola Corp.,** with **C. Russell Feldmann** as president of the combined businesses. International has machine tool plants in Elkhart and Indianapolis and a commercial welding division in South Bend, while Detrola makes radio and other electronic devices in Detroit.

Gehnrich Corp., Long Island City, N. Y., maker of industrial ovens, dryers and air heaters, has been purchased by **W. S. Rockwell Co.,** New York, N. Y., industrial furnace builder, and will be operated as **Gehnrich Oven Div.** of the latter company.

Graham Transmissions, Inc. Milwaukee, manufacturer of variable speed drives, has appointed five sales engineering organizations as representatives. They include Frank Campbell Coe, Commercial Trust Bldg., Philadelphia; John B. Foley, Jr., 249 Erie Blvd. West, Syracuse; Paul M. Kline, 2030 E. 22nd St., Cleveland; Bruce W. Rogers, P. O. Box 172, 850 S. High St., Akron; and D. W. Smith, 149 Broadway, New York, N. Y.

Oliver Iron & Steel Corp., Pittsburgh, has announced the formation of the Industrial Fasteners Div. with **James G. Graham** as general manager of sales. This division will handle all matters pertaining to the sale of products of the company in the industrial, transportation and jobbing fields.

Lockheed Aircraft Corp and Vega Aircraft Corp., Burbank, Calif., have been consolidated and hereafter will be known as Lockheed Aircraft Corp.

Boots Aircraft Nut Corp. has established an office in the LaSalle-Wacker Bldg., 221 N. La Salle St., Chicago, with **William F. Arnoldy,** head of the firm's Detroit office, in charge of this new branch also. He will make his headquarters in Chicago.

Taylor Freezer Corp., Beloit, Wis., ice cream machinery producer, will operate hereafter under the name of **DuMore Associates.**

Spotting The Air News

Though the jet propulsion plane has passed many tests and is now in production, it will play little part in this war and faces further development. Ten-grand monthly plane output not to be reached, due to heavy bomber emphasis

Let's keep calm about jet propulsion. It may become an important special tool in the hands of allied air forces, but conventional engines and propellers will be the mainstay of this war, and in the commercial aviation that follows it, for some time to come. The twin-jet fighter planes being produced now by Bell Aircraft will be assigned to training. A new pilot force, experienced in flight under jet power, is necessary before combat operations can be undertaken. First jet-powered planes assigned to duty probably will serve as interceptors and observers.

Rockets and jets are not the same thing, though they are first cousins. A rocket, like the old-fashioned Fourth of July type, is loaded with explosive, or fuel, ready-mixed with oxygen. When the charge is burned out the rocket is done. Some types can be reloaded. Rockets in various numbers are attached to airplanes for take-off assistance and to give bursts of speed in emergency. A jet engine receives fuel from a tank, mixes it with air, blows expanded hot air and gasses out its back end, just as a rocket does, except the thrust is constant till the fuel tank is empty.

It's a lot of hot air. That's the way insiders jokingly describe the new departure in airplane power. Reduced to its elements, a jet engine is a piece of pipe. An air compressor (supercharger) forces air in at the front end of the pipe. Fuel is injected and mixed with the air. It burns, or explodes, much as it does in the cylinder of an internal combusion engine. On its way back, the product of this explosion passes through a gas turbine. The turbine drives the supercharger. Finally, the hot expanded gas and air blows out the back, creating a powerful slipstream. Thus, by different means, a conventional engine-and-propeller unit, and a jet engine, do exactly the same thing, i.e., they project a backward rush of air, the opposite reaction of which is the forward thrust imparted to the airplane.

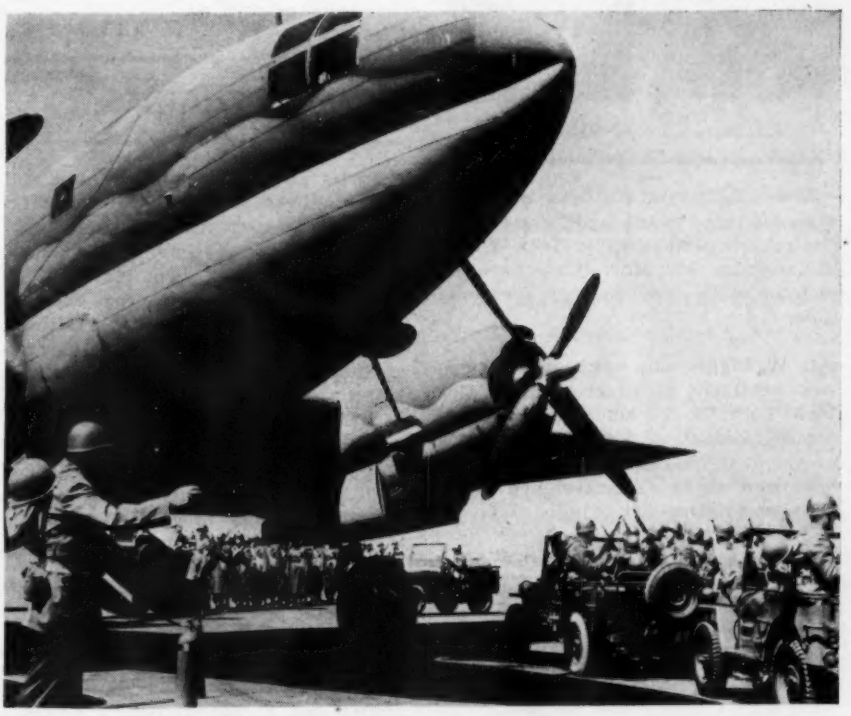
There is a catch in this pretty picture. The jet does not operate efficiently except at very high speed—above 400 miles per hour. It appears suitable just now only for planes of such high speed and ceiling that they can go on reconnaissance without heavy armor and armament, and to some extent for interception fighting. Fighter planes already had about all the speed and altitude that can be endured by pilots.

Several different versions of jet propulsion are known to air laboratories in all mechanized countries. Efforts are already under way to "gear down" the jet for use on slower planes.

Engineers admit, if you pin them down, that jet propulsion has the makings of competition for the aircraft engine and propeller in the indeterminate future. Going a step farther, it might be used on surface vehicles when and if it can be made sufficiently flexible, and be rid of its noise and other objectionable features. In fact, certain automotive concerns have acquired extensive interests in jet propulsion developments. A radio report from England says the fuel is kerosene. So far as Bell and the Army are concerned, the fuel is a military secret, but informed persons said it is both plentiful and reasonable in price.

The 10,000-planes-per-month goal this country has been shooting at will not be reached in this war, because we are already on the hump of aircraft production. The official schedule for 1944 is 113,000, which is less than 10,000 per month. But the Aircraft Production Board practices over-scheduling. The actual number of deliveries expected is 110,000. That adds up to a rate of 9,166, which is only 346 more than the 8,202 produced in December.

Meanwhile the tonnage of airframes rose from 56.0 million pounds in July to 73.6 in December. In 1941, total weight of airframes was 76.1 million pounds; in 1942 it was 253.1; and in 1943 it was 644.9. The estimate for 1944 is 1,009.0. All of these figures are airframes, minus engines, propellers, and spare parts. The bulge on weight and the plateau in units of course is due to heavy bombers. Production of heavies in December was 1224, including B-29 supers. This number will go right on up.



Transport Production Up—Presaging the wider use of military transport planes in 1944, the production of cargo planes of the Curtiss "Commando" type pictured here with troops going aboard, was sharply expanded by Curtiss-Wright Corp. during 1943. It is the largest twin-engined airliner type in the world

NAMES in the NEWS

H. I. Lewis, an official of American Hardware Co., Hartford, Conn., has joined the Weatherhead Co., Cleveland, as vice president. Formerly, Mr. Lewis was associated with the Seybold Div. of Harris-Seybold-Potter, Dayton, and with American Type Founders, Elizabeth, N. J.

E. L. Berry, vice president and general manager of Link-Belt Ordnance Co., was elected vice president of Link-Belt Co., Chicago, the parent organization. He began his career with the company in 1914, devoting his time to production and personnel matters. **Richard F. Bergmann,** chief engineer, has been named a vice president with headquarters at the Chicago office. He joined Link-Belt in 1924 through the purchase of Howe Chain Co., Muskegon, Mich.

Named Link-Belt Vice Presidents

E. L. Berry

R. F. Bergmann

James N. Morrell has been appointed sales manager of the Limitorque Valve Control Div., Philadelphia Gear Works, Philadelphia. Mr. Morrell has been associated with the company for some time.

D. W. Figgis, who has been executive vice president of American Can Co., New York, N. Y., since 1936, has become president; and **C. H. Black,** vice president in charge of sales since 1940, has been made executive vice president, succeeding Mr. Figgis.

Bruce A. Fleming has been named vice president in charge of sales of Edwin L. Wiegand Co., Pittsburgh, succeeding Ernest N. Calhoun who recently became president of the organization.

E. J. McSweeney, former superintendent of motive power for the Baltimore & Ohio R.R., has been named president of Vulcan Iron Wks., Wilkes-Barre, Pa. During the past year Mr. McSweeney has been in charge of the locomotive transportation program of the War Dept. in Washington.

Leon R. Ludwig, formerly head of the circuit breaker and protective devices division, Westinghouse Electric & Mfg. Co., E. Pittsburgh, has been appointed manager of the motor division. He has been connected with the company since 1925.

E. J. McSweeney

Leon R. Ludwig

T. C. Davis, formerly manager of industrial sales, Dayton Rubber Mfg. Co., Dayton, Ohio, has been advanced to vice president in charge of mechanical sales planning and experimental sales. **T. D. Slingman,** New York district manager, has been made vice president in charge of mechanical sales. In the manufacturing and development divisions of the company, **H. S. Mooradian,** superintendent, has been advanced to vice president in charge of production.

OBITUARIES

Curtis H. Veeder, 81, inventor and manufacturer, founder of Veeder Mfg. Co., Hartford, Conn., passed away in that city a short time ago. In 1886, he joined Pope Mfg. Co., Hartford, as a draftsman; and after four months he went to Calumet & Hecla Mining Co., Calumet, Mich., as chief draftsman of the mechanical department. From 1889 to 1893, Mr. Veeder was employed as draftsman and engineer at Thomson-Houston Electric Co., Lynn, Mass. Two years later he founded the Veeder Mfg. Co., becoming president. He retained this office until 1928 when the company was merged, forming the firm of Veeder-Root, Inc., of which Mr. Veeder was a director at the time of his death. He held patents on many mechanical devices including sewing machine improvements, electromagnetic clutches, automatic casting machines and a tachometer.

David W. Rodger, vice president and secretary, Federal-Mogul Corp., Detroit, Mich., died as the result of a self-inflicted gunshot wound. Mr. Rodger was 60 years of age, and had spent most of his business career with the firm, becoming a vice president in 1915. He was a past president of National Standard Parts Assn., a former officer of Automotive Parts & Equipment Manufacturers Assn. and was recently elected to the board of directors of the Automotive Council for War Production.

Frederick William Wood, president for 25 years of the old Maryland Steel Co., Baltimore, passed away at the age of 86 following a brief illness. In 1885 he became general manager of the Pennsylvania Steel Co., and when the Maryland Steel Co. was formed Mr. Wood was named president and served from 1891 to 1916. He was made manager of the Bethlehem Steel Co. plant at Sparrows Point, which succeeded the Maryland firm.

Nelson S. Hopkins, 73, died as the result of injuries received in an automobile accident. In 1915 he was manager of the Curtiss Aeroplane & Motor Co., Ltd. of Canada. Later he organized the Phoenix Aircraft Co. of Williamsville, N. Y.

Roland J. Houck, 51, manager of the manufacturing division of Motch & Merryweather Machinery Co., Cleveland, passed away in Tucson, Ariz. Mr. Houck had been associated with the organization 34 years, having been manager of the used machinery department for many years.

William H. Bunting, vice president of Bunting Brass & Bronze Co., Toledo, died at the age of 71. Mr. Bunting was one of three brothers who who joined their father in founding the company in 1910.

MEETINGS

American Gas Assn. War conference. Hotel Seneca, Rochester, N. Y. Mar. 30-31.

American Management Assn. Annual conference of personnel. Palmer House, Chicago, Ill. Feb. 9-11.

American Society of Mechanical Engineers. Spring meeting. The Tutwiler, Birmingham, Ala. Apr. 3-5.

American Society for Testing Materials. Spring meeting. Netherland Plaza, Cincinnati, O. Feb. 28-Mar. 3.

American Society of Tool Engineers. Annual meeting. Bellevue Stratford Hotel, Philadelphia. Mar. 26-27.

National Screw Machine Products Assn. Annual meeting. Waldorf-Astoria Hotel, New York. Jan. 27-28.

Dental Handpiece, one-fourth larger than actual size. The Dental Specialty Manufacturing Company, Denver, Colorado

Once Again Anaconda Hot Pressed Parts *improve the product... reduce the cost*

CUTTING manufacturing costs on a competitive product is always a worthy goal. But when the parts on which the savings were made prove to be stronger, result in fewer rejects, and serve better functionally, the accomplishment becomes doubly worthwhile—and is often the result of close cooperation between the manufacturer and the supplier of the metal. This was the case with THE DENTAL SPECIALTY MANUFACTURING Co., of Denver, Colorado.

Take part "B" for instance, on the dental handpiece illustrated: Originally the head slugs were made of round brass rod involving screw machine work, milling, annealing, die forming and then final machining. However, upsetting the metal in the forming die occasionally caused minute cracks which leaked grease when the part was machined to the necessary thin wall. Through the use of an Anaconda Hot Pressed Part, all operations but the final machining were eliminated. Result: A more accurately formed part of more dependable metal, no grease leaks—and a 50% reduction in costs.

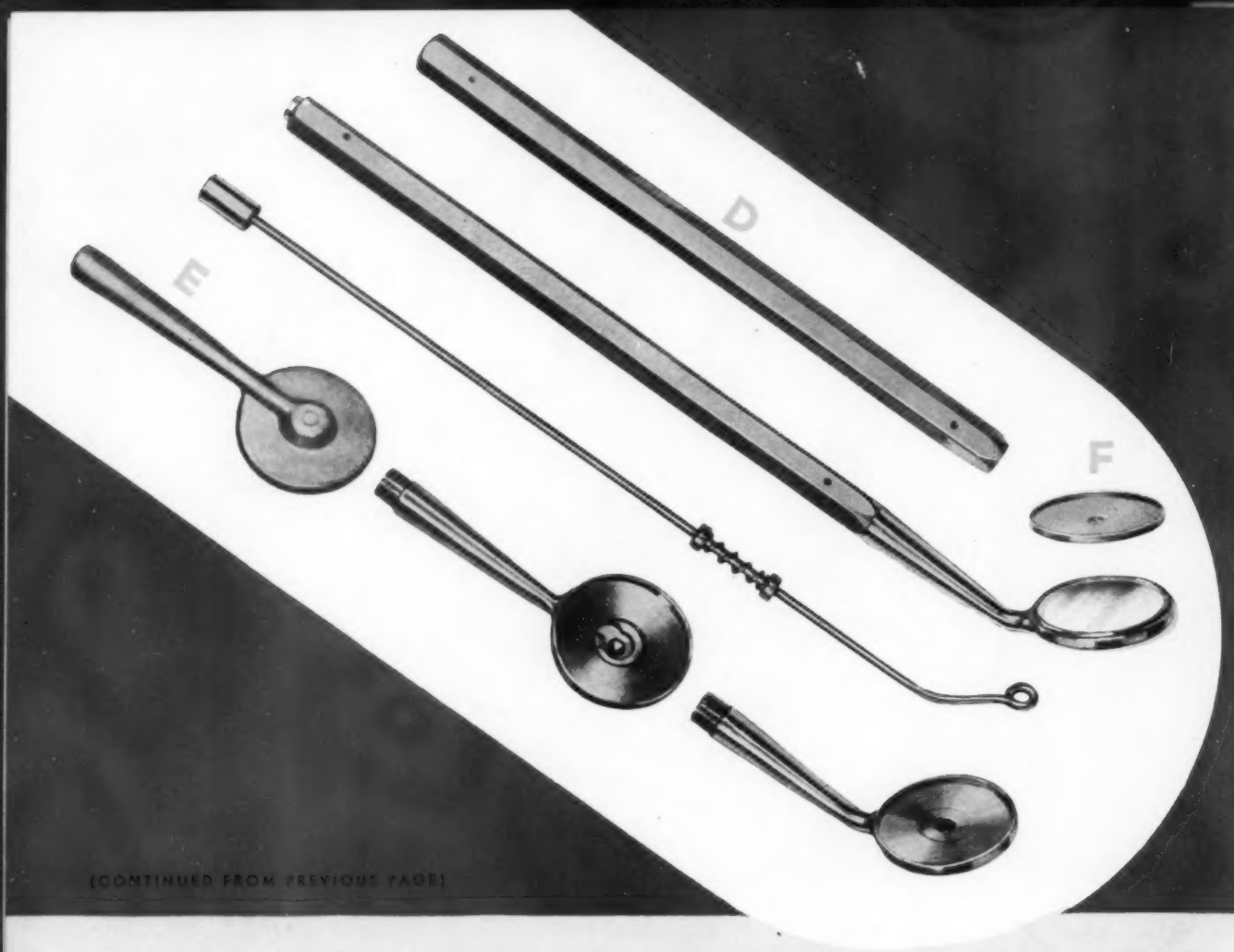
Practically the same conditions, and the same solution—another Anaconda Hot Pressed Part—applied to the elbow slug, illustrated at "A".

At "C" is shown the "Contra-Angle Head Shield." This shield slides down over a locking mechanism to prevent the whirling burr lock from contacting the patient's mouth. Formerly made of drill rod for its spring qualities, the shield was drilled out to a thin wall, hardened and ground to shape—an expensive and not too satisfactory procedure. A representative of The American Brass Company suggested that hard drawn brass tube, punched to shape, might serve equally well. It did—and costs were cut from 27c to 3c per piece.

(TURN TO NEXT PAGE, PLEASE)

ANACONDA
from mine to consumer

Anaconda Copper & Copper Alloys



(CONTINUED FROM PREVIOUS PAGE)

. . . and what better material than BRASS for a Dental Mirror assembly like this?

LET'S TAKE it apart, piece by piece, and see what brass and other copper base alloys have contributed to the design, appearance, and ease of manufacture.

The handle, "D" is a hexagon yellow brass tube. Drilled, chamfered on the ends and tapped with a fine-pitch thread, it is ready for plating.

"E" is another Anaconda Hot Pressed Part. One view shows the rear of the blank; another shows the part after the stem has been drilled, polished and threaded. The face is then recessed and the center counterbored for accurate movement of the wire loop which permits ready release of the mirror. After machining, the forging is bent to the desired angle.

The mirror holder "F" is a sheet brass stamping, fitted with a recessed brass pin that engages the wire loop. The push rod is a brass wire, hard enough to provide sufficient rigidity—yet soft enough to permit ready forming of the loop. Spacers and rod cap are free cutting brass, turned, drilled and cut to length. The spring is Anaconda Beryllium Copper—well known for its high resilience. This metal can be formed or machined in its softest form, then heat treated to a strength and hardness exceeding any other copper alloy.

All the parts illustrated are chromium plated—easily accomplished on brass because of its smooth finish and inherent capacity for quickly taking a fine polish from a simple buffing operation.

Needless to say we're proud of the volunteered statement of MR. R. W. BROWN, Vice President of THE DENTAL SPECIALTY MANUFACTURING CO.: ". . . our successful reduction in costs was due to the efforts and help extended to us by your local Denver Office which, for the past several years, has cooperated with us on many new developments".

Perhaps we can be of similar service to you or your engineering department.

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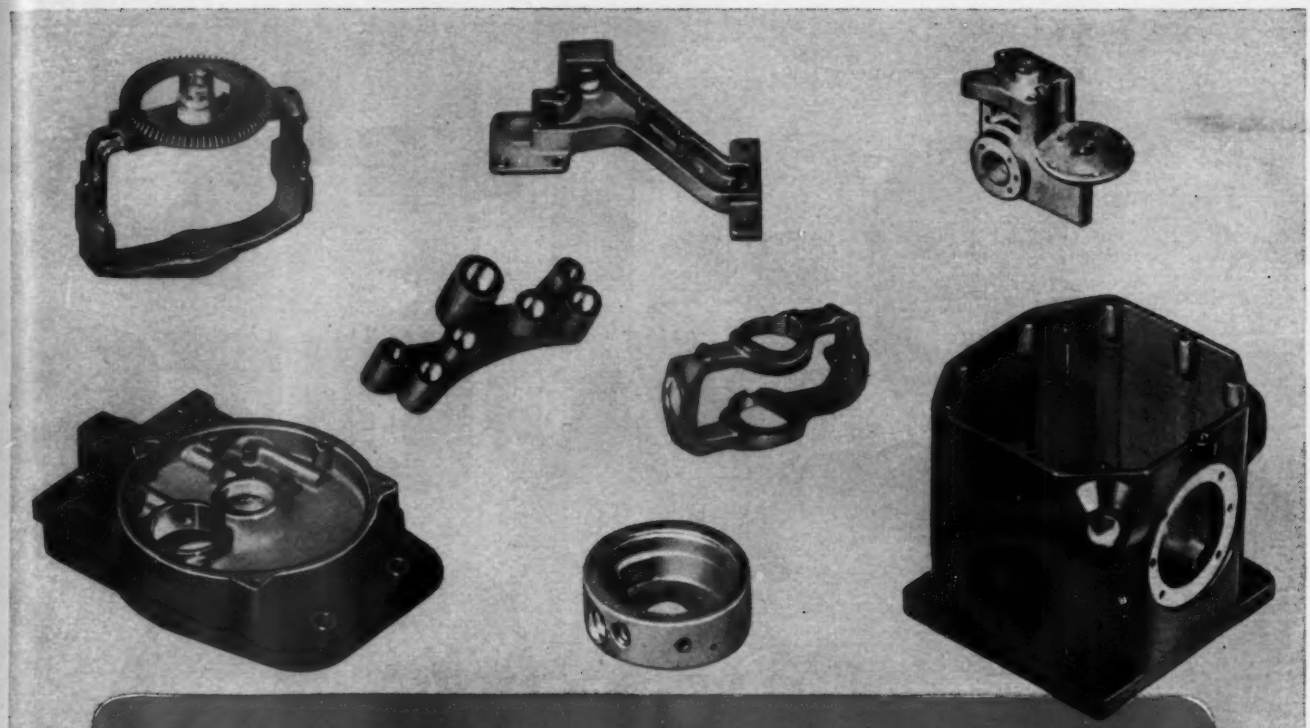
ANACONDA THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut · Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ontario



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made with "CONTROLLED METALS"

Maximum service from Auto-Lite Die Castings is assured by our application of "CONTROLLED METALS." Spectrographic analysis, metallographic studies, X-ray inspection, physical testing, heat treating, etc., are all combined into the production of Auto-Lite Die Castings. This rigid control, even when parts are of intricate design, assures uniform die castings which meet exacting specifications and serve more efficiently wherever applied.

The Auto-Lite Die Casting plant combines under one roof complete facilities for die casting, machining and finishing either from zinc or aluminum. Auto-Lite's wide experience, within the limits of today's wartime demands, is available in adapting and producing die castings to meet your individual requirements.

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Sizes: No. 4 to 1½" diameter. Pat'd and Pats. Pend.

SELF-LOCKING HOLLOW SET SCREW

Our most recent development is the Self-Locking *Knurled Point* "Unbrako" Set Screw, providing an added measure of industrial safety and greatly reducing maintenance worries. When "Unbrako" Hollow Set Screws with Knurled Points are tightened—they stay tightened, because the knurling makes them absolutely self-locking, so that they will never unwind by themselves or shake loose under vibration. They can be easily and quickly removed whenever desired, and used over and over again.

Yes, the "Unbrako" Self-locking Hollow Set Screw was evolved in response to your needs. It was you, the users, who first insisted upon hollow set screws for use in our "Hallowell" Steel Shaft Collars, back in 1909. Then, as interest in "Safety First" grew, demands for hollow set screws on whirling machinery increased, and we went to work making them by the millions.

Our complete line of "Unbrako" screw products, including the Knurled Socket Head Cap Screw, is shown in our "Unbrako" catalog. Send for it today.

The KNURLING of Socket Screws originated with "Unbrako" years ago

OVER 40 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

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Utilization of electrical horsepower is an accurate gauge to progress, both industrial and social. American industry used 33,844,131 h.p. in 1929, jumped to 45,291,319 in 1939, and, since 1939, has gained more than any other two countries in the world. For the past 27 years, Howell Motors have supplied an ever-increasing amount of horsepower for American industries. Today, Howells are serving every important industry in America.

HORSEPOWER

BY HOWELL - FOR YOUR INDUSTRY

You're looking at the electric motor that has won a high place in American industry for dependability, quiet operation and honest value.

It is a precision-built motor throughout.

In wartime production, where time is precious and delays are disastrous, here is another feature of Howell Motors you cannot afford to overlook:

You can load them with full confidence in their ability to stand up under the toughest jobs you can assign within the limits of safety.

Now that the War Production Board requires you to use electric motors of the lowest possible horsepower you are safe in specifying horsepower by Howell.

Let Howell engineers aid you in selecting the proper rated motors for your requirements and obtain this safety factor which is so vital in these times.

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Said the Hatter...

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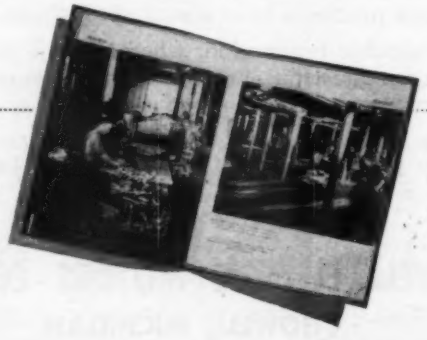
For nearly seventy years, scores of manufacturers in every line of industry . . . in peacetime and in war . . . have brought to Taft-Peirce their knotty problems in design, development, tooling, and contract manufacturing. Their reasons have been as varied as their products . . . lack of plant facilities . . . lack of manpower . . . and, very often, a lack of experience in the new fields they planned to enter.

Here, in the Taft-Peirce Contract Division, they have had their lacks supplied by a compact, mobile organization with an all-inclusive store of experience, and a plant equipped to produce *economically* anything from a single production tool to complete mechanisms, machines, or products in carload lots. No job is too large, none is too small, and any phase of Taft-Peirce Contract Service may be engaged without the others.

Today, the roster of Taft-Peirce contract clients has extended so widely that it has become almost a country-wide commonplace to advise: "If you have a good idea —but not the time or experience to develop, tool up, or build it—then *Take It To Taft-Peirce.*"



Taft-Peirce Contract Service...

is described and illustrated in this interesting gravure volume, a copy of which you may obtain by writing on your letterhead to: *The Taft-Peirce Manufacturing Co., Woonsocket, Rhode Island.*

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to KEEP 'EM WORKING!

Everyone marvels at the speed of American production for war . . .

But how many realize that much of the credit should go to machine tool designers?

They are the ones who created the *tools* for doing the job.

They're making production miracles commonplace . . . with the most efficient machine tools that ever whipped raw material into finished product.

And the secret? For one thing, they try to design each component part of a machine so that it outlasts the machine itself.

They know that failure of a single machine in a mass production setup might bring whole assembly lines to a stop.

So they lean heavily on Nickel alloyed materials for the critical parts of machine tools.

Over the years they have learned that Nickel contributes toughness, strength, and fatigue resistance . . . properties vitally essential to many different kinds of tool parts . . . from grinder frames to tail shafts, from gears and spindles to drill chucks and lathe beds.

In the industries which use machine tools, it's an axiom that "a little Nickel goes a long way" to keep 'em working.

Whatever *your* industry may be . . . if you want help in the selection, fabrication, and heat treatment of alloys . . . we offer you counsel and data.

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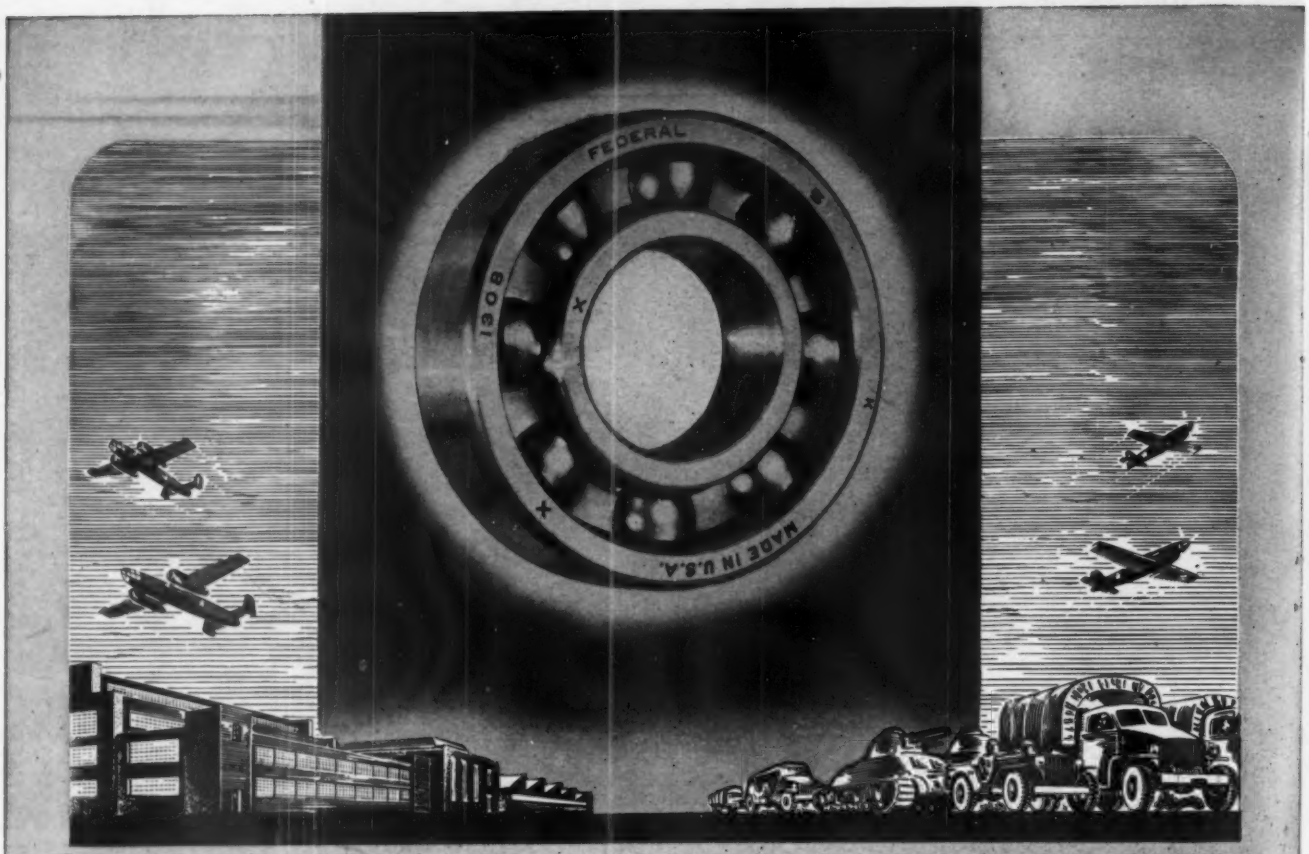

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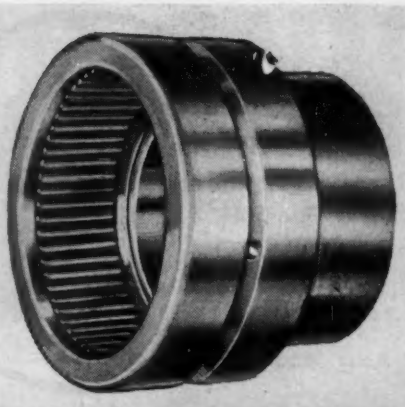
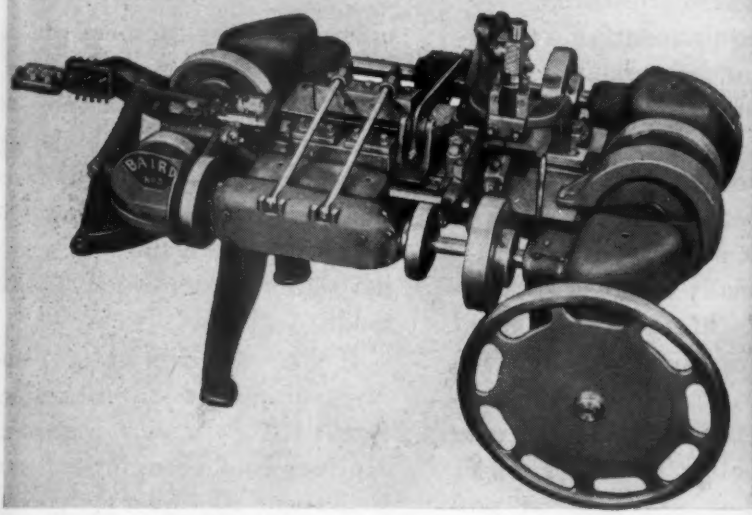
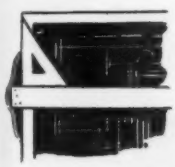
CAMS RUN FAST AND SMOOTH ON





ORANGE ROLLER BUSHINGS



Have you a product on the drafting board requiring protection of rotating or oscillating parts against friction and wear? Orange Roller Bushings give you the solution—whether to carry heavy loads in limited space . . . to provide even, quiet, high speed running . . . to maintain smooth, precision operation —or to add longer life to hard-working parts.

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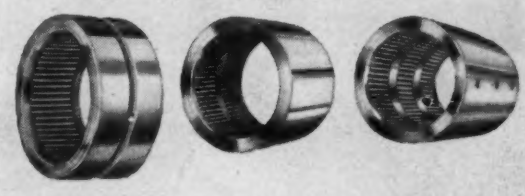

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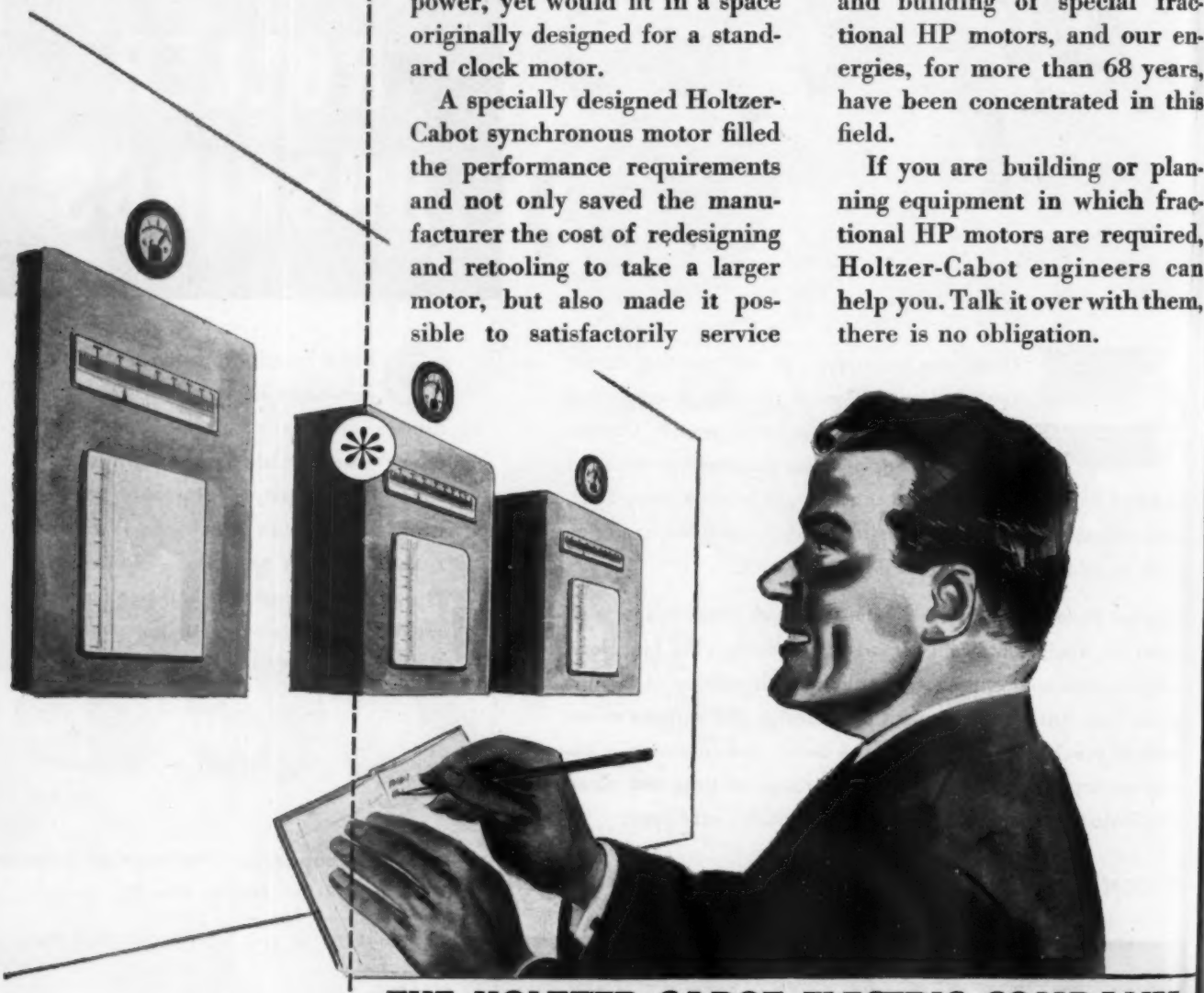
The requirements of a manufacturer of instruments called for a motor that had unfailing constant speed and increased power, yet would fit in a space originally designed for a standard clock motor.

A specially designed Holtzer-Cabot synchronous motor filled the performance requirements and not only saved the manufacturer the cost of redesigning and retooling to take a larger motor, but also made it possible to satisfactorily service instruments in customers' plants that had the old type of motor.

The specialized business of Holtzer-Cabot is the designing and building of special fractional HP motors, and our energies, for more than 68 years, have been concentrated in this field.

If you are building or planning equipment in which fractional HP motors are required, Holtzer-Cabot engineers can help you. Talk it over with them, there is no obligation.



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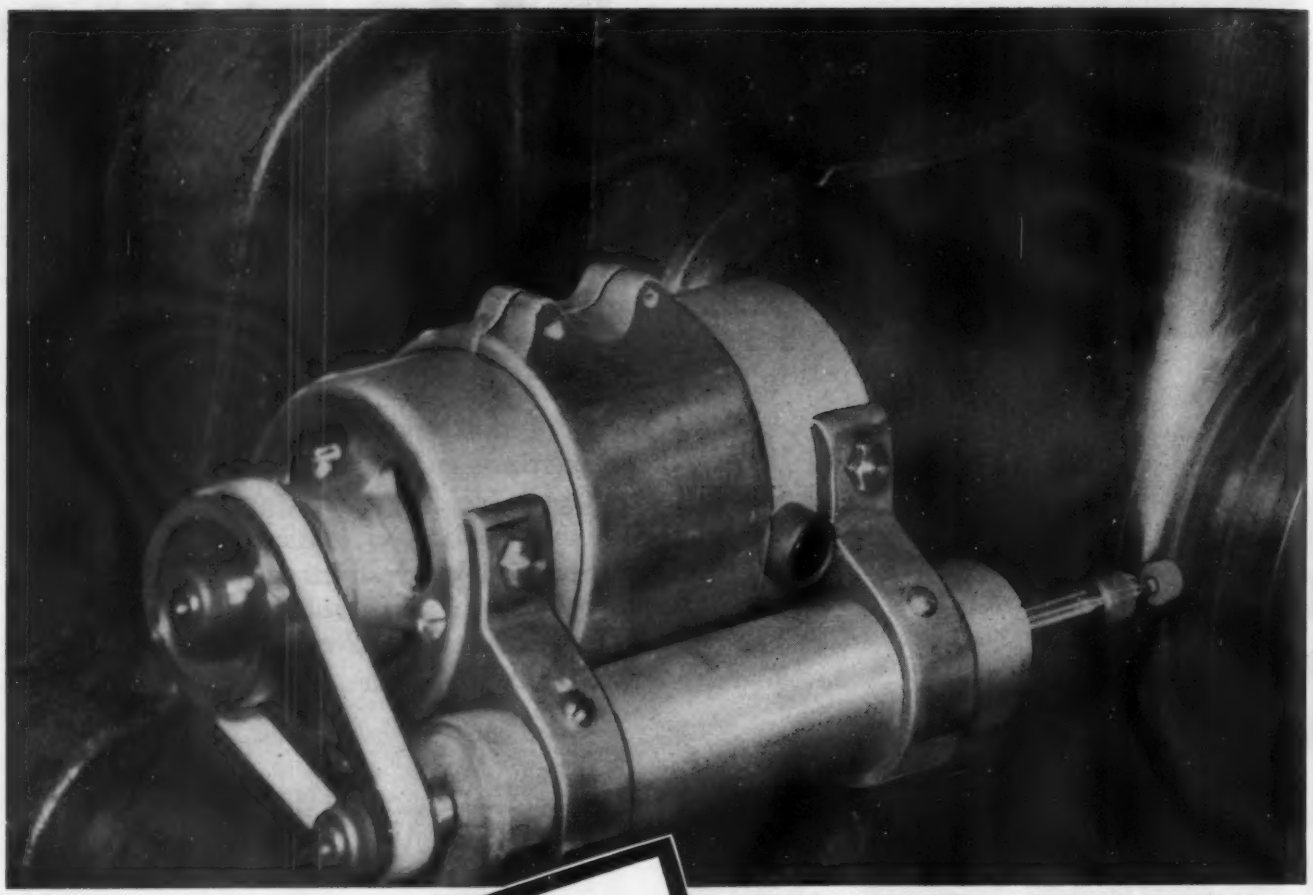
On home front production lines Bunting Bronze Standardized Bearings and Bars, completely machined and finished, available from stock are speeding production and maintenance of machine tools, electric motors, and industrial equipment of all kinds. Many different sizes. Ask your wholesaler. Write for catalog. The Bunting Brass & Bronze Company, Toledo, Ohio. Warehouses in Principal Cities.

Above—typical Bunting Bearings for big guns. Below— Bunting Bronze Standardized Bearings and Bars.

● *The Official U. S. Marine Corps photo from O. W. I. shows Marines unlimbering the mighty "Whirlaway" about to go into action in the South Pacific.*

Bunting

BRONZE BUSHINGS • BEARINGS • PRECISION BRONZE BARS



● Themac high speed, portable, electric, precision grinder
Built by THE McGONEGAL MANUFACTURING CO.

40,000 r.p.m. on precise bearings

SKF

BALL AND ROLLER BEARINGS

There's no need to worry about bearing trouble on metal removing jobs where this Themac Precision Grinder works. When the spindle turns at 40,000 r.p.m., four SKF Deep Groove Ball Bearings—two on the spindle and two on the motor—easily take combined radial and thrust loads.

Deep, uninterrupted symmetrical races and a groove curvature closely conforming to the balls enable SKF Deep Groove Ball Bearings to have large contact areas. In addition, they're made of through-hardened materials to exactingly close tolerances by workmen skilled in precision. Bring these advantages to a Themac grinder, and you have an ideal combination for fast, accurate war work. 5457

SKF INDUSTRIES, INC. • FRONT ST. & ERIE AVE. • PHILADELPHIA 34, PA.

PAGE *Welding* ELECTRODES

Then you know how important it is that the metal deposited in the weld shall equal the Stainless you are welding. **PAGE** took away all uncertainty in that regard when they, in cooperation with the largest manufacturers of Stainless Steel, produced a complete range of **PAGE-ALLEGHENY STAINLESS STEEL ELECTRODES**—a range so complete that from it you can select the exact electrode for your work.

★ ★ ★

Because Stainless Steel stands so high on the list of critical materials, it is more than ever necessary to see to it that the electrode you are able to get will give you the proper metal in the weld. And it becomes even more essential to see that you get electrodes of the proper diameter and that your men waste none of them.

PAGE STEEL AND WIRE DIVISION

Monessen, Pa., Atlanta, Chicago, Denver, Los Angeles, New York, Pittsburgh, San Francisco, Portland

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

ESSENTIAL PRODUCTS . . . TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, Yacht Rigging, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

IS *One Part* PUTTING A HIDDEN TAX ON YOUR BUSINESS?

IS some difficult part boosting your cost curves up and forcing production curves down? . . . putting a hidden "withholding tax" on your investment in equipment and men?

Contact KAYDON

If current war production or postwar product planning overtaxes your manufacturing capacity . . . or if hard-to-make parts slow down your schedule . . . the precision production facilities of Kaydon may offer a practical answer to your problem. Well equipped to specialize in production of difficult parts, Kaydon has capacity now to assure "on time" deliveries of high precision units, made exactly as specified.

CAPACITY Immediately AVAILABLE for ball and roller BEARINGS Size 6" to 60"

For excellence in production of extremely precise, unusually large ball and roller bearings.

ARMY E NAVY

THE KAYDON ENGINEERING CORP.

McCRACKEN STREET • MUSKEGON 81, MICH.

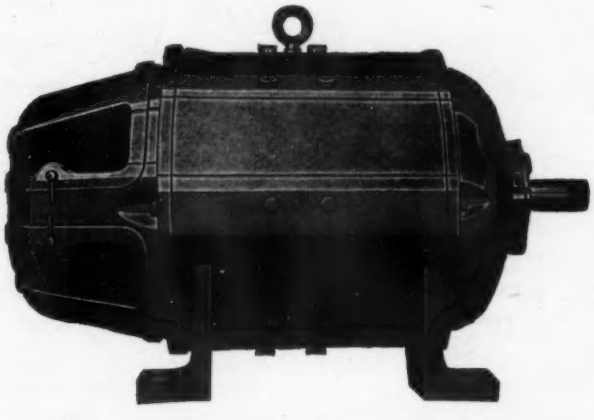
Specialists in Difficult Manufacturing

QUICK REVERSE!

The ability of the electric motor, with suitable control, to do a special and difficult task on production machinery is well demonstrated by the reversing motor-drive as worked out by Reliance engineers for a variety of applications.

This drive is automatic, direct, positive and reliable. Automatic reversal at any desired point in a cycle of operations can be provided. It can be combined with speed control and safety features. Maintenance costs are less.

Pioneering work by Reliance men in making use of these characteristics has paid out in simplified machine design, faster operation, reduced maintenance requirements and increased safety. Complete information is yours for the asking.



"Know how" in both electrical and mechanical design, translated into special mechanical parts and electrical characteristics, plays a big part in the fast and dependable operation of Reliance Reversing Motor-drive.

RELIANCE A·C D·C MOTORS

RELIANCE ELECTRIC & ENGINEERING CO.

1088 Ivanhoe Road • Cleveland, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Detroit • Greenville (S.C.) • Houston • Los Angeles • Minneapolis • New York Philadelphia • Pittsburgh • Portland (Ore.) • St. Louis • Salt Lake City • San Francisco • Syracuse • Washington, D. C. • other principal cities.

SPEED TREAT PLATE

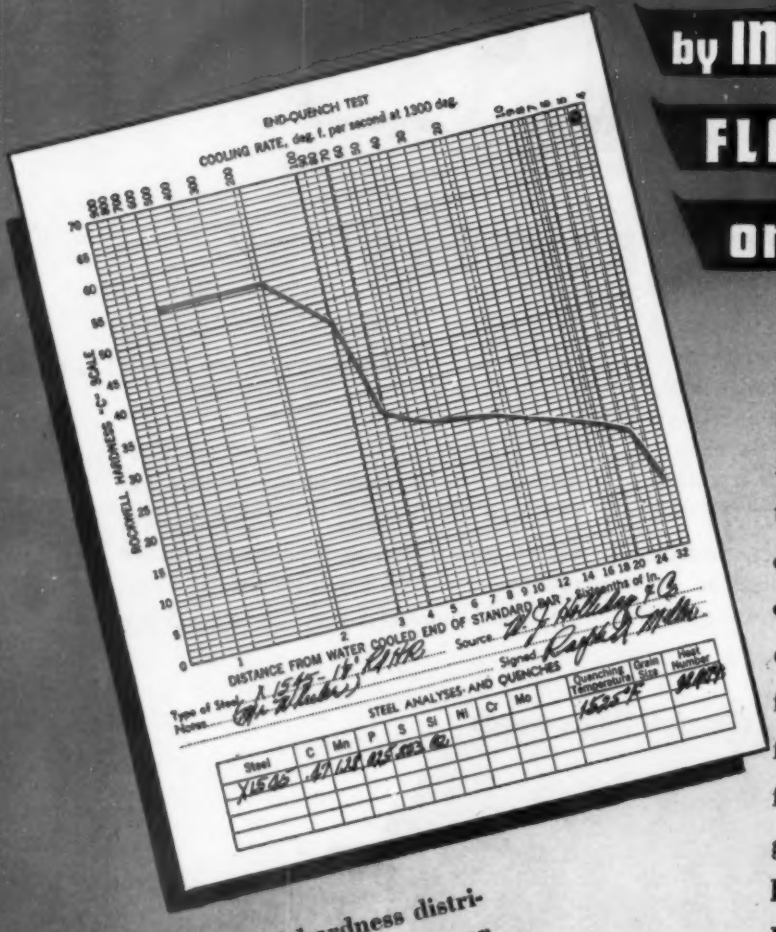
IS THE IDEAL STEEL FOR PARTS TO BE

SURFACE-HARDENED—

by INDUCTION HARDENING

FLAME HARDENING

or PACK HARDENING



A typical hardness distribution chart: jominy or end quench test from an average heat of *Speed Treat*.

Machine and equipment builders have found *Speed Treat* plate the ideal steel for making parts of every type that are to be induction, flame or pack hardened for this steel offers full development of the most desired properties: rapid transformation of structure, higher surface hardness and a ductile core, freedom from distortion and negligible scaling. Speed, accuracy and hardness control are simplified and hardening cost is reduced to a new low.

***Fastest machining of any medium carbon steel*—a recognized advantage of *Speed Treat* steel—implies its logical use by all production machinery builders.**

W. J. HOLLIDAY & CO.

Hammond, Ind.

Brown-Wales Company
493 C Street
Boston, Mass.

Beals, McCarthy & Rogers, Inc.
Buffalo, N. Y.

"Established 1856"

American Wholesale Hardware Company
1500 W. Anaheim St.,
Long Beach, Calif.

Horace T. Potts Company
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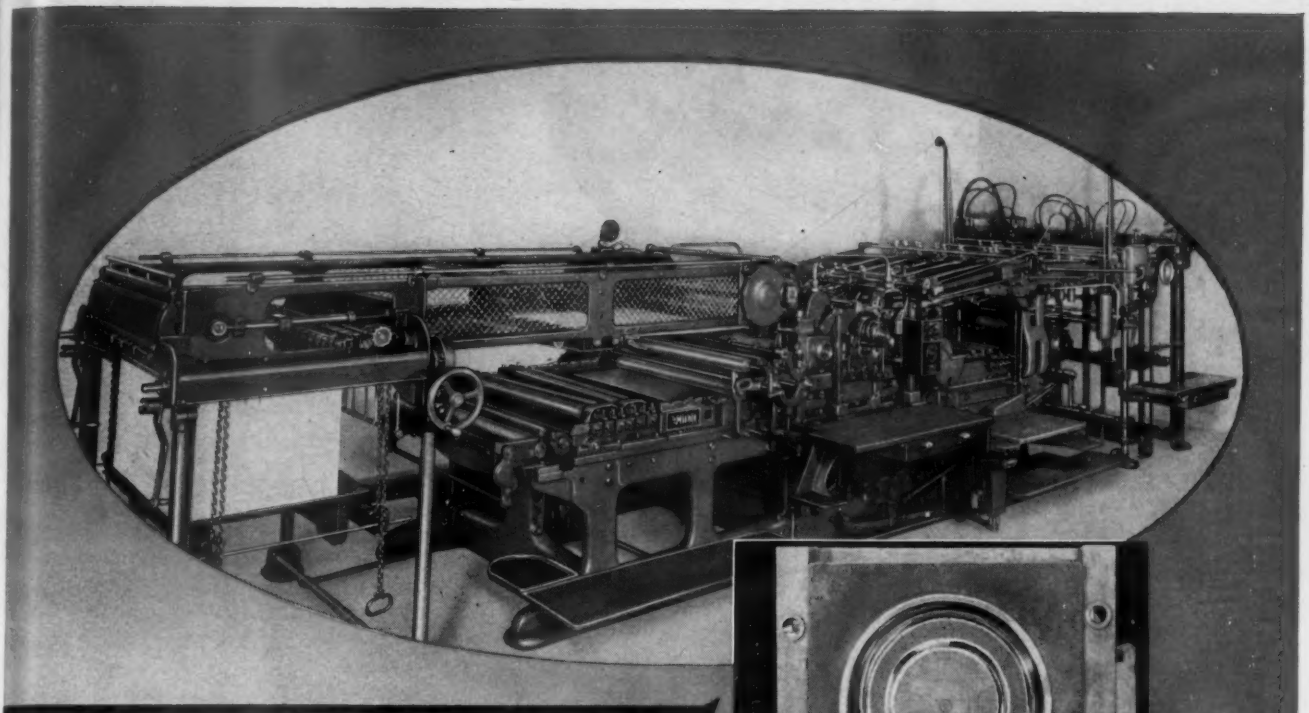
Philadelphia, Pa.

Indianapolis, Ind.

Burger Iron Company
Akron, Ohio

Peckover's Limited
77 Front Street, E
Toronto, Ont., Canada



SPEED TREAT STEEL

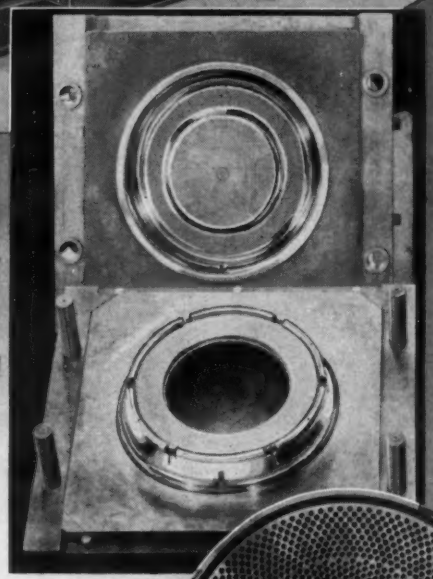
Assures Higher Quality

And Longer Life

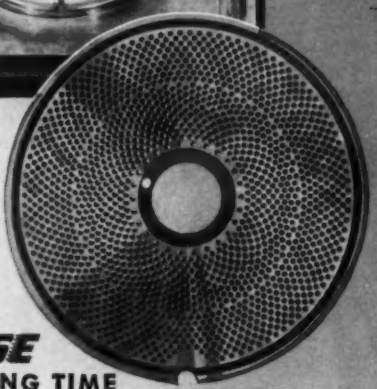
The problem of surface-hardening teeth of odd-shaped gears, the wearing surfaces of cams, racks and bearer rings used in the construction of high grade printing presses was quickly solved by this manufacturer by induction hardening these parts of *Speed Treat* steel.

In parts of this type, the use of this faster machining steel contributes savings up to 32% in reduced machining time and longer tool life; improved finish also resulting. You can effect similar economies in your production by adopting *Speed Case* and *Speed Treat* steel plate for machined parts.

Send for new illustrated Catalog No. 1243. Contains complete story and technical details on *Speed Case* and *Speed Treat* steel plate. Every mold, die and machinery designer, builder and production man should have a copy.



A mold maker says: "*Speed Case* meets all requirements. The mold shown, for making clock cases, called for an extremely hard, high polished surface. Lower die 6" plate, top die 5" plate. Carburized with maximum distortion of .003". Steam plate, also made of *Speed Case*—it surely meets all requirements.



SPEED CASE
REDUCES DRILLING TIME
54.5% PLUS—

A meat grinder plate and knife manufacturer reports: "Using Speed Case plate, we reduced drilling time 54.5%, facing time 41.25% and drill costs 93.73%."

SPEED TREAT *Free Machining Medium Carbon Steel Plate*

SPEED CASE *Free Machining Open Hearth Steel Plate*

Quality Controlled *Speed Case* and *Speed Treat* steels are available in all common plate sizes, hot rolled and cold finished bars.

W. J. HOLLIDAY & CO.

Hammond, Ind. — *"Established 1856"* — Indianapolis, Ind.

Brown-Wales Company
493 C Street
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Buffalo, N. Y.

American Wholesale Hardware Company
1500 W. Anaheim St.,
Long Beach, Calif.

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East Erie Avenue & D Street
Philadelphia, Pa.

Burger Iron Company
Akron, Ohio

Peckover's Limited
77 Front Street, E
Toronto, Ont., Canada

Strong
LIKE THE COUNTRY THEY SERVE

HALLOWELL

WORK BENCHES

Fig. 928
"Hallowell" Work-bench. Laminated wood top. Drawer is extra Pat'd and Pats. Pending

You can always count on "Hallowell" Work-Benches to stand firm wherever they're installed. Sturdily built, they have strong legs of steel, flanged and ribbed for reinforcement—tied together with flanged stringers into an extremely rigid structural unit. Benches require no bolting to the floor, thereby saving installation time and cost.

"Hallowell" Work-Benches also offer a greatly varied selection from which to choose—they're made in 1367 interchangeable combinations!

For use where the installation of steel equipment is war-restricted, you can now get "Hallowell" Duration Type Work-Benches of wood. Also available in wood "for the duration" are famous "Hallowell" stools, foremen's desks and tool stands.

Fully illustrated bulletins of Work-Benches and other shop equipment in the "Hallowell" line gladly sent upon request.

"Hallowell" De luxe Shop Furniture for post-war use

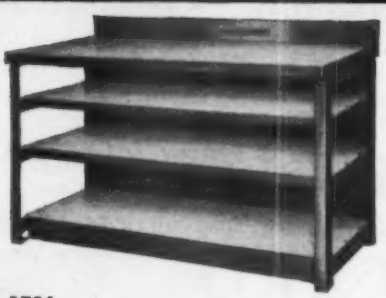


Fig. 1724
"Hallowell" Bench. Open unit — with backboard and three adjustable shelves.

Designed to better meet specific functional needs of modern industry, "Hallowell" De luxe Shop Furniture will be available shortly after the war. These new work-benches, desks, tool stands, chairs, etc. will have the same outstanding sturdiness and durability that characterize present "Hallowell" items. Their standardized construction with interchangeable shelf, cabinet and drawer units will meet practically any requirement.

Over 40 Years in Business

Fig. 1734
"Hallowell" Bench, with backboard, lower shelf and two receding door cabinets, one unit open.

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA., BOX 4 · BRANCHES: BOSTON · DETROIT · INDIANAPOLIS · CHICAGO · ST. LOUIS · SAN FRANCISCO

PRE-forged

to **improve** your product

Pre-Forged to improve your product . . . Pre-Forged to reduce rejects in your plant . . . Pre-Forged to make your job easier and to help you make a better profit. Follansbee's unique Pre-Forging process presents these and numerous other definite advantages.

Follansbee steel is made in small basic open hearth furnaces—poured into small ingot molds—then *forged* into billets by a 1,000 ton press. The pressure exerts a direct kneading action to the very center of the ingot, resulting in a denser, more homogeneous structure than any other process can impart to steel. The uniform cross-sectional structure of Follansbee steels consistently provides high transverse and longitudinal values . . . more uniform response to heat treatment . . . greater resistance to fatigue—hence longer life in your finished product.

Follansbee's exclusive Pre-Forging process assures high quality, sound steels.

FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES • PITTSBURGH 30, PA.

Sales Offices—New York, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, St. Louis, Nashville, Los Angeles, Toronto and Montreal, Canada. *Plants*—Follansbee, W. Va. and Toronto, Ohio

ALLOY BLOOMS, BILLETS, BARS, SHEETS & STRIP
COLD ROLLED SHEETS & STRIP • POLISHED BLUE SHEETS • ELECTRICAL SHEETS & STRIP • SEAMLESS TERNE ROLL ROOFING

QUALITY ACCURACY PRECISION

FOR THE DURATION. WE ARE UNABLE TO SUPPLY MANY TYPES OF BEARINGS FORMERLY MANUFACTURED

"Commercial" ANNULAR BALL BEARINGS

THE SCHATZ MANUFACTURING CO.
U. S. A.
REPRESENTATIVES LOCATED AT
Detroit: 2640 Book Tower • Chicago: 902 S. Wabash Ave.
Cleveland: 402 Swetland Bldg. • Los Angeles: 5410 Wilshire Blvd.

THE VICTORY SCRAP BANK DRIVE IS ON NOW

SCRAP piles have taken on a new significance these past few years. Far from being regarded as useless junk, they have become vital national resources. To produce the extra millions of tons of steel needed for war now and in 1944 will require a proportionate amount of scrap. At the outset of the war huge stockpiles were quickly collected from obvious junk scattered plentifully everywhere. Certainly it's more difficult to find this much needed scrap today, unless you are constantly searching for it. So make it a point to clean out your shop (and your home) regularly of all but the absolutely essential metal. Deposit this in the Victory Scrap Bank . . . a deposit that will pay you *real dividends.*

AL

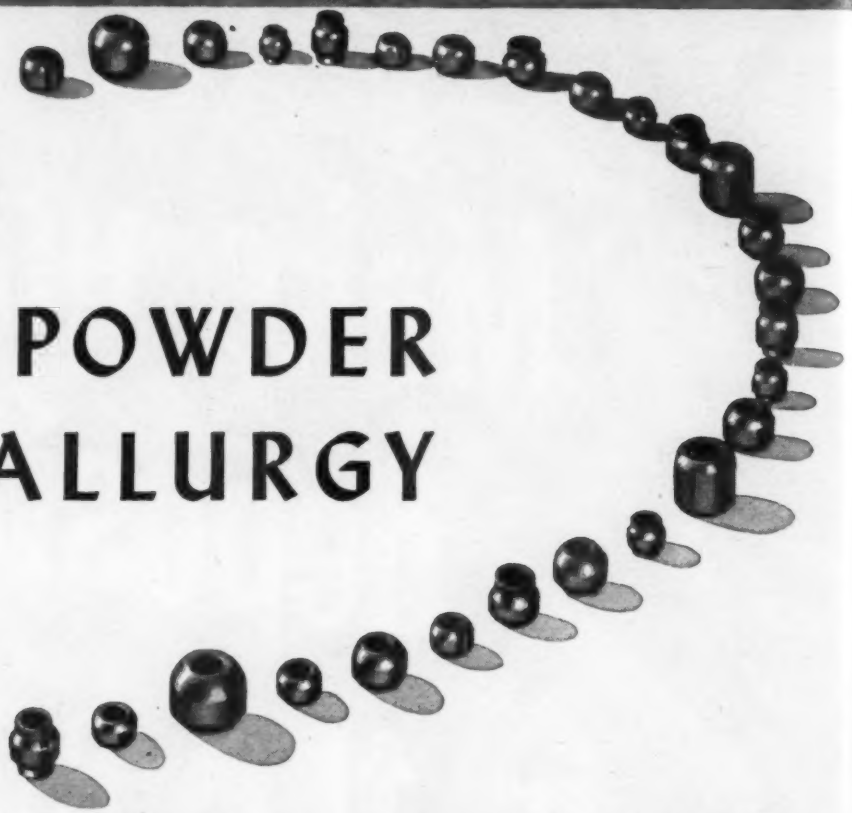
STEEL FOR THE NATION'S WELFARE

Allegheny Ludlum
STEEL CORPORATION
BRACKENRIDGE, PENNSYLVANIA

JOHNSON BRONZE

SLEEVE TYPE BEARINGS

Ledaloyl
SELF LUBRICATING
BRONZE



POWDER METALLURGY

for

SELF-ALIGNING BEARINGS

SLEEVE TYPE BEARINGS

Cast Bronze Bearings
Cast Bronze Graphited
Sheet Bronze Bearings
Sheet Bronze Graphited
Bronze and Babbitt Bearings
Steel and Babbitt Bearings
Steel and Bronze Bearings
Ledaloyl
Self-Lubricating Bearings
Electric Motor Bearings
Automotive Bearings
Bronze Bars
Bronze Castings

Any Type
Any Size
Any Quantity

● Before the development of the science of powder metallurgy, the many advantages of self-aligning bearings were often outweighed by the extra cost involved in producing them. This was due in great part by the intricate machining operations necessary. Now you can secure self-aligning bearings made from Johnson LEDALOYL Bronze . . . the newest development in powder metallurgy. This method of making bearings eliminates all machining, provides accuracy, and adds the extra advantage of self lubrication.

Designers of products for the future will do well to consider the use of Johnson LEDALOYL Bronze. This is true not only for bearings but for other small, intricate parts. Johnson LEDALOYL is made from pre-alloyed bearing bronze, and parts properly designed and installed will usually outlast the motive unit. In some cases, the self lubricating quality enables manufacturers to seal the bearing in place, thus eliminating the necessity of further lubrication and lubrication fixtures.

A Johnson Sales Engineer will gladly help you decide which applications you have that are best suited for LEDALOYL. There is one located as near as your telephone. Why not call him in—TODAY?

DISTRICT SALES OFFICES: Atlanta · Boston · Buffalo · Chicago · Cincinnati · Cleveland · Dallas Detroit · Kansas City · Los Angeles · Minneapolis · Newark · New Castle · New York · Philadelphia Pittsburgh · St. Louis · San Francisco · Seattle

JOHNSON BRONZE

SLEEVE BEARING HEADQUARTERS

THE MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD

515 S. MILL STREET NEW CASTLE, PA.

IN THE TIGHT SPOTS IT'S A STAR!
This new and distinctive Star trademark symbolizes the modern electric motor. Symbolizes, too, Star's modern engineering and production service.
Through this service, Star makes its motors fit the actual "tight spots" of the machines of war—and gives them the power and stamina to meet the "tight spots" of battle. And through this same service, Star will engineer the "tight spots" of many postwar industries as it has done so successfully for all the industries now served by Star.
STAR
POWER PACKAGED AS YOU NEED IT
ARMY
NAVY

STAR ELECTRIC MOTOR COMPANY, BLOOMFIELD, N. J.

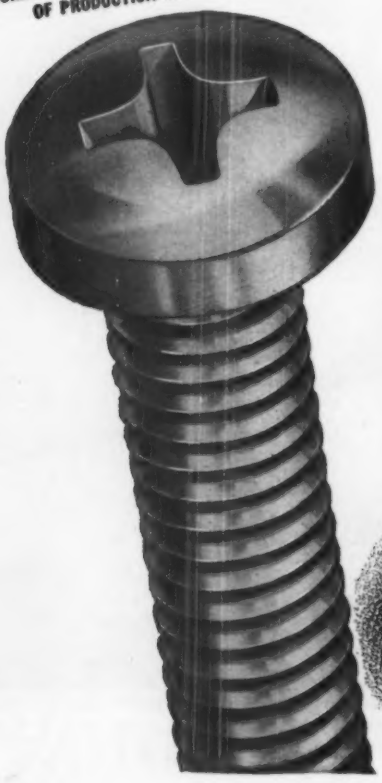
"The Inspector and I Get Along OK"

. . . since we changed to

AMERICAN PHILLIPS SCREWS

that drive straight and set up tight . . . with no burred heads or scarred work

WORLD'S EASIEST, FASTEST, SAFEST METHOD OF PRODUCTION SCREW DRIVING



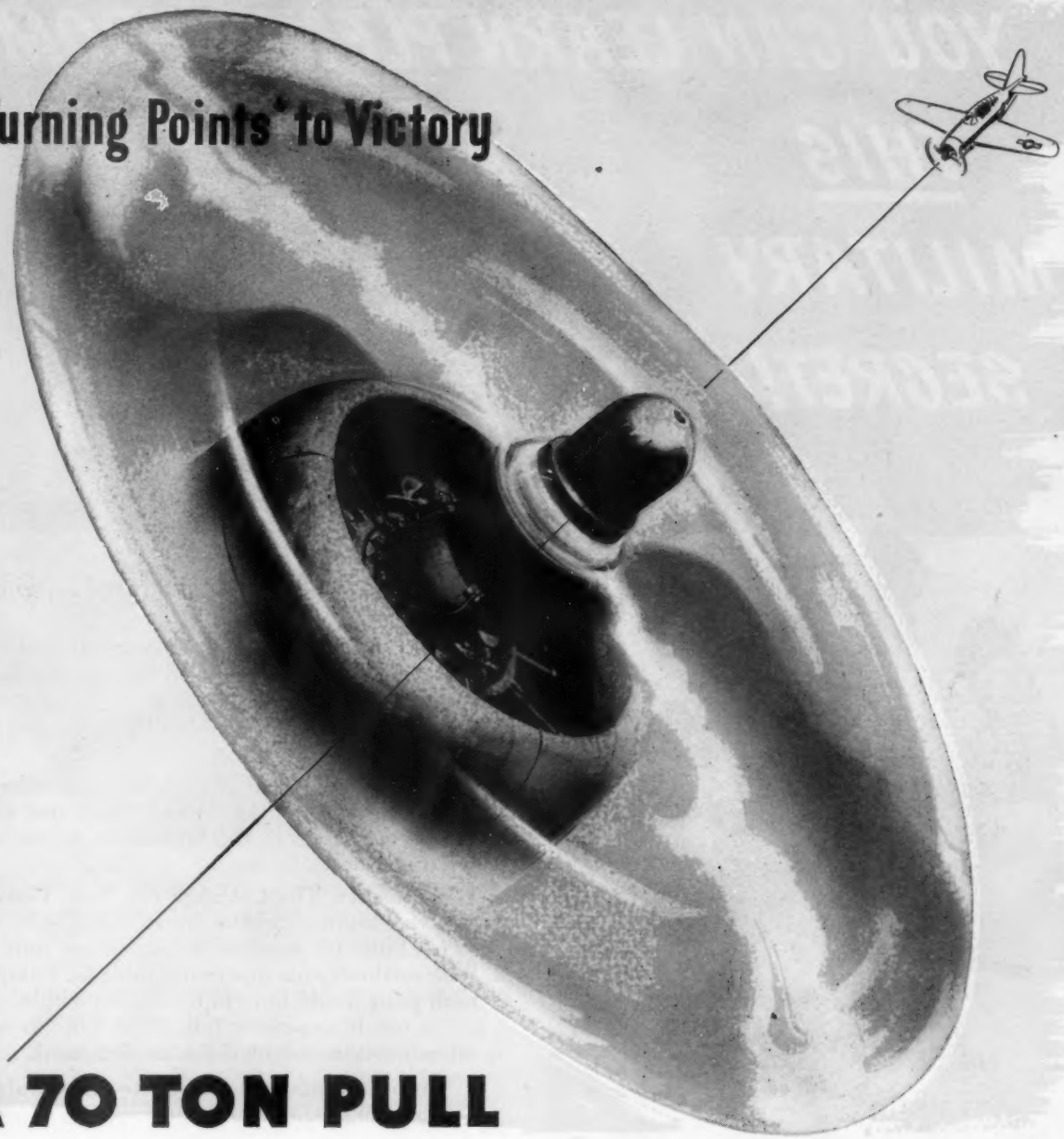
Every fastening made with American Phillips Screws is a clean, strong fastening . . . *the first time it's made.* No crooked screws to be re-driven. No burred and broken screw-heads to be backed out and replaced. No holes to be re-tapped.

Neither are there any gouges on the work-surface, to cause rejection of finished material. For the Phillips Driver engages the American Phillips Recessed Screw Head in a firm contact, making one single, self-aligned driving unit *that stays put until the screw is turned up tight and flush.* There's no wobbling at the start, no physical strain in the driving operation. So women and inexperienced men can keep up the work-pace, without difficulty or undue fatigue. And output increases as time-per-fastening is cut . . . as much as 50%.

In addition, there are special advantages to American's brand of Phillips Screws: *Full Value,* assured by automatic weigh-count. *Piece Inspection* of head, thread, and point. *Delivery Service,* maintained by high-speed production. *Engineering Service,* at *your* service on any special fastening problem. That's why more and more buyers of screws specify: "American brand".

AMERICAN SCREW CO.
PROVIDENCE, RHODE ISLAND
Chicago: 589 E. Illinois Street
Detroit: 502 Stephenson Building

"Turning Points" to Victory



A 70 TON PULL

With its 2000 horsepower engine opened up, this 13 foot propellor exerts a pull estimated at 70 tons on the Fafnir blade bearings . . . a vivid example of power and speed carried frictionlessly on ball bearings.

After the heavy raid of the American 8th Air Force on Schweinfurt, center of Germany's ball bearing industry, the official report read in part:

"These Schweinfurt plants turned out a tremendous amount of ball bearings for German war machines.

"All high speed moving parts depend upon ball bearings to eliminate friction. They must have ball bearings to operate war equipment. This attack . . . amputates a huge part of the Nazi's ability to keep moving machinery in operation."

In a mechanized war, friction can be as destructive as enemy bullets. That is why ball bearings are at the "turning points" of practically every piece of fighting equipment.

Millions of Fafnirs are proving their worth in America's fighting machines and in busy industrial machines here at home. Their worth will be just as steadily proved in the machines and vehicles of the peaceful world toward which we fight. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR BALL BEARINGS

YOU CAN LEARN PLENTY FROM THIS MILITARY SECRET!

Read how assembly was simplified to get speed... with security

The "inside story" of this war-essential electronics apparatus cannot be revealed because it would aid the enemy. But, there's no secret about the method used by the maker to avoid assembly difficulties, and get fastening speed with security.

Twenty-eight metal and plastic assemblies are made with P-K Self-tapping Screws. Only one easy operation is required . . . the Screws are driven into plain, untapped holes.

The maker, The Langevin Co., New York, says: "If P-K Self-tapping Screws weren't available, we'd have to tap holes for machine screws, or use nuts and bolts. Both methods present serious problems. To tap properly, both parts would have to be aligned within close limits . . . a tough, expensive job. With P-K Screws, we can allow much more tolerance in alignment.

"Since we cannot reach inside to run on nuts, complete re-design of the unit would be necessary to use bolts."

SOLVED... Five Metal and Plastic Fastening Problems

1 Six P-K Hex Head Self-tapping Cap Screws fasten plastic terminal board to transformer and bell.

2 Four P-K Hex Head Cap Screws attach plastic terminal plug to metal bracket. On opposite end (not shown) four P-K Type "Z" Screws make similar fastening.

3 Four P-K Hex Head Cap Screws fasten two canvas-backed plastic resistor strips to a metal bracket inside same part.

4 Eight P-K Type "Z" Screws fasten two canvas-backed plastic resistor strips to 22 gauge metal brackets on amplifier chassis.

5 Two P-K Type "U" Drive Screws fasten nameplate to the product.

Try this SIMPLER Method . . .

No matter what metal or plastic you use, try the simple, Self-tapping Screw method. In 7 out of 10 cases you'll find you can eliminate tapping, and fumbling with bolts and nuts; do away with inserts in plastics, or cut out riveting or welding in hard-to-reach places.

Call in a P-K Assembly Engineer to check over your fastening jobs with you. Or, mail assembly details for recommendations. Parker-Kalon Corporation, 194-196 Varick Street, New York 14, New York.

SELF TAPPING SCREWS FOR EVERY METAL AND PLASTIC ASSEMBLY

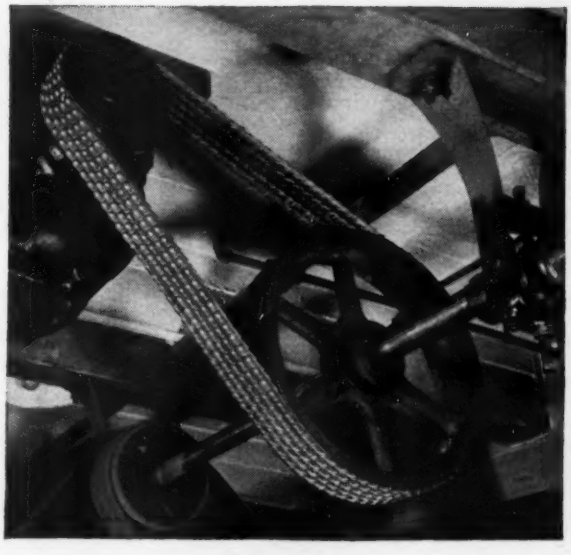
PARKER-KALON

Quality-Controlled

SELF-TAPPING SCREWS

"EASE OF INSTALLATION
...SAVING OF TIME"

Put Veelos on These Drives



ASKED why he chose Veelos for lineshaft drives of a company among the leaders in its field, the Chief Engineer gave these reasons: (1) "ease of installation" and (2) "saving of time."

Thousands of Veelos installations are proving that the Chief Engineer was right because:

1. *"EASE OF INSTALLATION."* Any desired length of Veelos—the link V-belt—can be uncoupled from an economical stock roll in less than 60 seconds... and, in another minute, can be coupled endless and installed on any drive.

2. *"SAVING OF TIME."* With Veelos in rolls, V-belts can be replaced in a few minutes... reducing machine downtime.

These are just two of twelve important production advantages of Veelos. Check on the others... *write today for free 8-page illustrated manual* giving applications, construction detail, installation directions, engineering data.

MANHEIM MANUFACTURING & BELTING CO.
MANHEIM, PENNSYLVANIA

VEELOS
THE LINK
V-BELT
ADJUSTABLE TO ANY LENGTH
ADAPTABLE TO ANY DRIVE

★ THE JOHNSON FRICTION CLUTCH ★

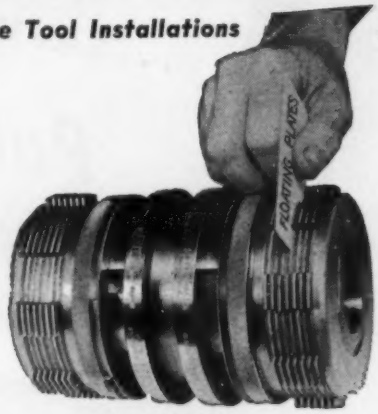
The new "MAXITORQ" MULTI-FLOATING DISC CLUTCH*

Particularly Adapted to Machine Tool Installations and for Use in All Industrial Machinery

WET TYPE: All discs of hardened steel, to be run in lubricant.

DRY TYPE: Alternate discs of steel and self-lubricating bronze.

SINGLE



DOUBLE

DOUBLE

SPECIAL CHARACTERISTICS

FLOATING DISCS: Minimum of drag, abrasion or heating in neutral.

MANUAL ASSEMBLY: Assembled or taken apart, without use of tools.

ADJUSTMENTS: Manually, by turning knurled ring clockwise after raising locking spring.

ENGAGEMENT: Easily controlled, with light pressure.

DESCRIPTION

"Maxitorq" FD Multiple Disc Clutches are supplied in *single* or *double* type. The double is a compact, integral unit, and is not a combination of two single clutches. Non-metallic shoes with studs are supplied with each clutch. These, riveted into the engaging lever, prevent wear in shipper sleeve groove.

In neutral, no disc touches the ones adjacent to it (FD, Floating Discs). A separator spring* between each pair of inner discs, spreads these endways with an accordion action, so that light can be seen between all discs.

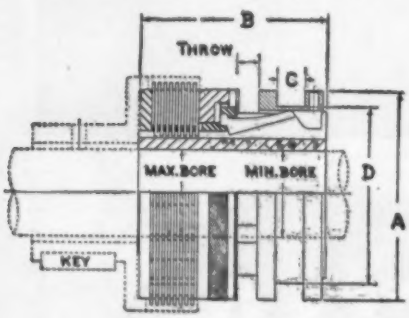
A locking plate* on the disc end of each clutch (two on double type) locks all discs against this spring tension. Counter-clockwise movement of three or four turns of knurled adjusting ring removes this spring tension, locking plate can be pressed endways slightly against the discs, when 1/6th of a turn (either way) of the locking plate releases it, and this plate and all discs can be removed, and the balance of the clutch taken apart.

The separator springs assure quick disengaging and prevent excessive drag, abrasion or heat so common in many clutches of the multiple disc type. No oil release holes or radial oil grooves required in the plates of the FD type "Maxitorq."

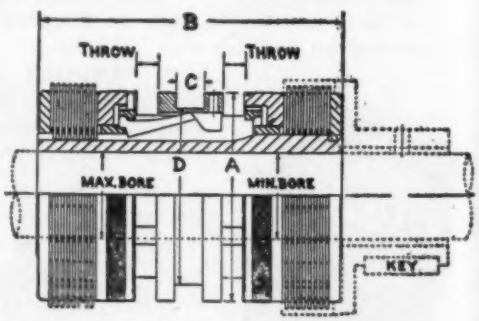
These patented improvements in clutches covered by the registered trade name *"Maxitorq"* are new to multiple disc clutch construction, developed after 40 years of experience in manufacturing the well known† "Johnson" Expanding Ring Friction Clutch. They are the result of years of research, breakdown tests, and actual use for several years on machine tools and other industrial machinery.

* Patented: U. S. and Foreign Countries.

† Johnson Type similarly listed in Thomas' Register.



Note: Cupped Hub (dotted member), should be hardened steel, with hub fitted with bronze or anti-friction bearing. Not standard equipment, but can be supplied at extra price to meet customers' requirements.



ALL DIMENSIONS NOTED BELOW ARE IN INCHES

Clutch No.	Disc Dia.	H.P. at 100 R.P.M.	Max. Working Torque Ft. Lbs.	No. of Discs	Body Bore Min.	Body Bore Max.	Body Bore Keyway	Axial Pressure, Lbs.	Driving Lugs No.	Driving Lugs Width	Throw to Engage	A Single	A Double	B Single	B Double	C Single	C Double	D Single	D Double
22	2½	½	27	12	1	1⅛	5/16 x 1/8	30	3	.740	3/16	3⅛		3 11/16	5 11/16	½		2⅛	
23	3¼	1	53	14	1¼	1⅜	¼ x 1/16	30	3	.990	1/16	3⅝		4 1/16	6 11/16	⅝		3¼	
24	3¾	1¾	92	14	1½	1⅝	⅜ x 1/16	40	3	.990	1/16	4⅛		4 1/16	6 11/16	⅝		3⅝	
25	4½	3	158	14	1¾	1⅞	⅜ x 5/32	60	8	.740	1/16	4⅝		4 5/16	7 1/16	¾		4⅛	
26	5½	5	263	16	2	2¼	½ x 3/16	80	12	.615	¼	5½		5	8 1/16	¾		4⅝	

Write for "Maxitorq" FD Blue Bulletin, Series No. 3

★ THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN ★

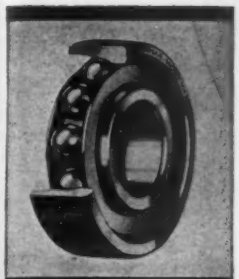
ON THE FIGHTING FRONTS!
ON THE PRODUCTION LINES!

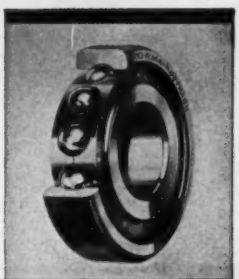
The PRECISION BEARINGS here pictured, together with many others from the comprehensive NORMA-HOFFMANN line, have literally "gone to war" for the Allied Nations.

On the fighting fronts, they are "in the service" in every type of naval craft, from patrol boat to battleship—in bombers, fighters, scout planes, trainers and transports—in guns, tanks, mobile artillery, military transport and supply equipment.

On the production lines, NORMA-HOFFMANN Bearings are in thousands of machines, machine tools, and other vital mill and shop equipment that are turning out ships, armament and indispensable war materials for the American and Allied forces.

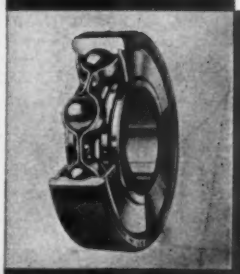
Let our engineers work with you.

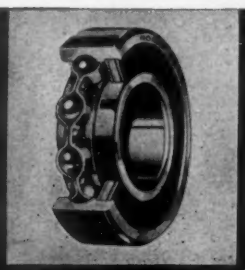

Separable (Magneto) Ball Bearing

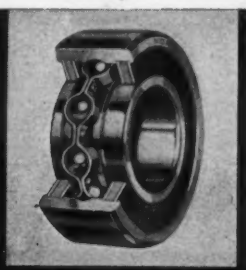

Litra ("CL") Composition Retainer Ball Bearing

Single Row Ball Bearing

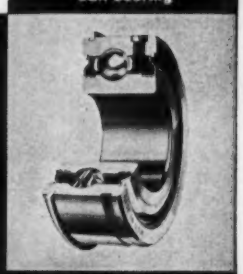
Double Row Self-Aligning Ball Bearing

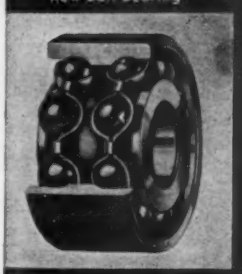

Shielded Type Single Row Ball Bearing


Single Felt Seal Ball Bearing

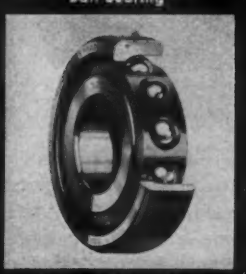

Double Felt Seal Ball Bearing

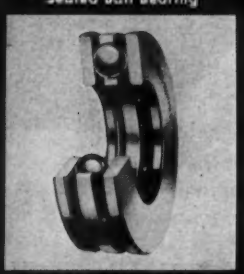
9000 Series (Feltless) Sealed Ball Bearing

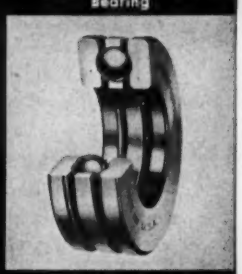

"Cartridge" Fully Sealed, Refillable Type Ball Bearing

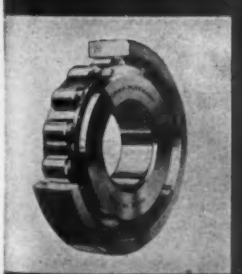

Double Row Ball Bearing

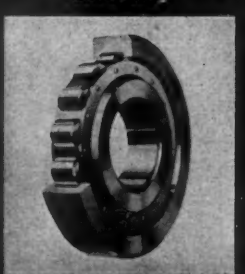
Extra Light Type Ball Bearing


Angular Contact Ball Bearing


Extra Light Single Direction Ball Thrust Bearing

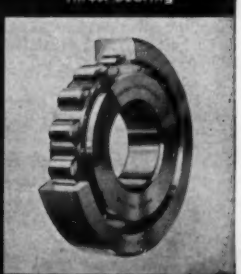

Single Direction Ball Thrust Bearing


Standard Cylindrical Roller Bearing


Type "E" Cylindrical Roller Bearing

Full Type (Retainerless) Cylindrical Roller Bearing

Extra Light Cylindrical Roller Bearing

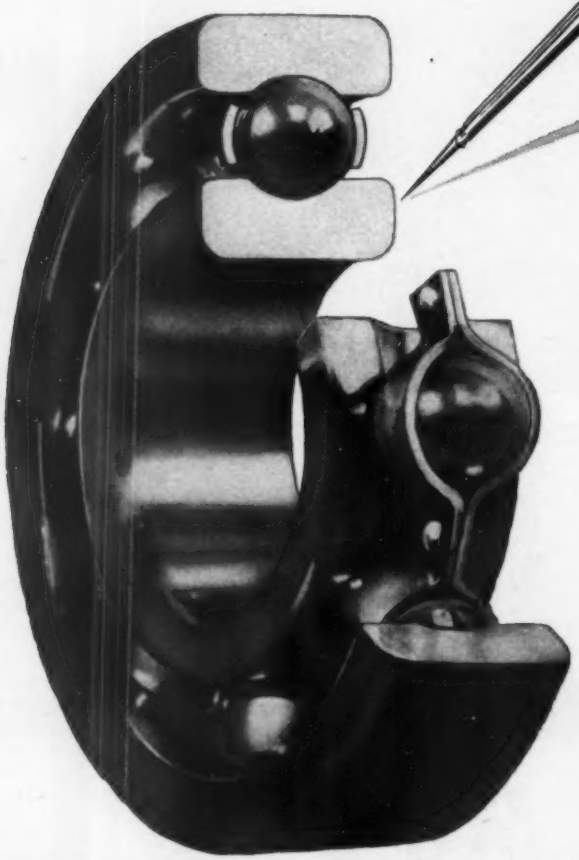

Two-Lipped Cylindrical Roller Bearing

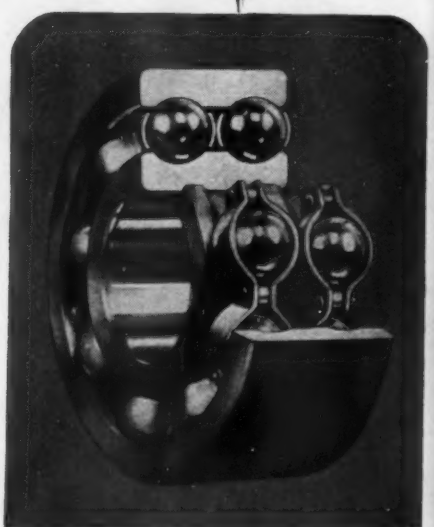
NORMA-HOFFMANN BEARINGS CORP'N, STAMFORD, CONN., U. S. A. • FOUNDED 1911

TO WIN THE WAR! Work — *Fight* — Buy War Savings Bonds

"Standard Equipment"

FOR POST-WAR DESIGN





POST-WAR design will change many familiar machines . . . create new ones. But post-war design will not change the tested principle that no machine can out-perform its bearings.

BCA Ball Bearings...proved in the past . . . proved in the present . . . will remain "standard equipment" for machine makers and machine users who demand bearings that are soundly engineered . . . carefully manufactured . . . rugged . . . and with ample load capacity to meet service requirements.

The performance of BCA Ball Bearings is one stable factor upon which you can base future design or purchase, no matter how far ahead you may be planning. Tomorrow, as ever, BCA Ball Bearings will safeguard the machine maker's reputation . . . the machine user's production. Plan now to be sure they're part of your post-war equipment.

BEARINGS COMPANY OF AMERICA, LANCASTER, PENNA.

BCA

RADIAL • ANGULAR CONTACT • THRUST

BALL BEARINGS

Treat Bearings Right!
They're in the Right!

1. Use only neutral mineral lubricants.
2. When lubricating with grease, it is not advisable to have the housing more than one-half to two-thirds full. Too much grease may cause generation of heat faster than it can be dissipated by the surrounding housing.

Standardize on Standard Sizes.

GAZE ON A MIRACLE IN *Gear Production*

BOMBERS carrying bigger loads than freight cars! Fighters that can dive faster than sound travels! These are modern miracles of air warfare—miracles made possible by the giant Wasp Engines that power these planes.

And miracles beget miracles. For in these engines are gears of such extreme precision that their manufacture by any other method save exhausting hand labor, was long deemed impossible. Transforming these hand methods into mass production—turning out these high-precision gears by the hundreds of thousands needed for the world's largest air armada—was an achievement made possible by new manufacturing methods—new production techniques developed by Foote Bros.

These precision gears may well open the way to new miracles in the economical transmission of power when the war is won. For already on the boards of many American manufacturers are plans for machines that will utilize the type of precision gear Foote Bros. are producing for aircraft engines.

FOOTE BROS. GEAR AND MACHINE CORPORATION
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Better Power Transmission Through Better Gears

the secret of getting FASTEST DELIVERY

Don't wait for "routine" afternoon pickups, when shipping AIR EXPRESS. Get your shipments on the way as soon as they are ready — as early in the day as possible.

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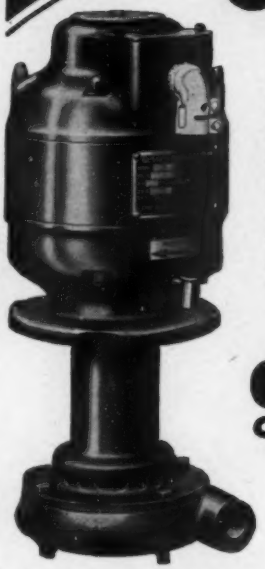


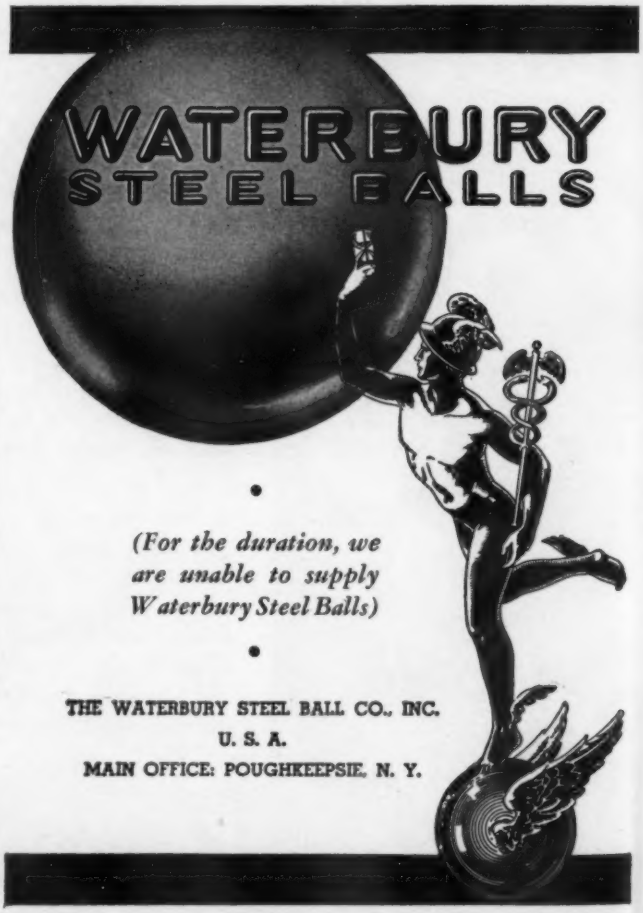
As one shift relieves another Gusher Coolant Pumps are ready to go . . . and keep on going. Simple design—fewer parts to wear—makes Gusher Pumps "steady performers." You get a copious flow of coolant when you want it and where you want it. There's a Gusher model for your requirements. *Write*

GUSHER COOLANT PUMPS

MODEL 9040—Available in any current characteristics, including 25 cycle, 1, 2, or 3 phase. Totally inclosed ¼ h.p. motor.

THE RUTHMAN MACHINERY CO.
1809 READING ROAD CINCINNATI, OHIO
LARGEST EXCLUSIVE BUILDERS OF COOLANT PUMPS

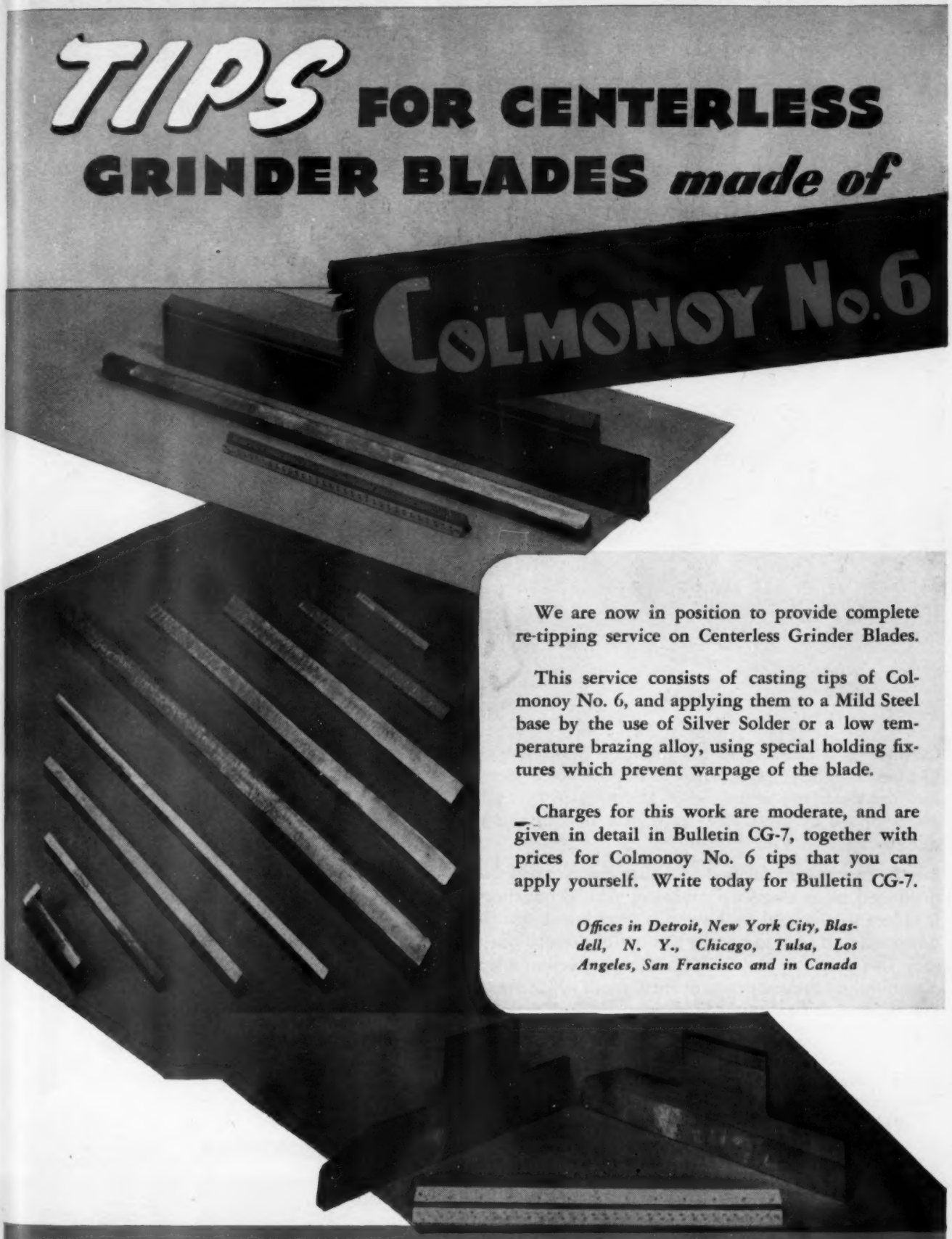
WATERBURY STEEL BALLS



(For the duration, we are unable to supply Waterbury Steel Balls)

THE WATERBURY STEEL BALL CO., INC.
U. S. A.
MAIN OFFICE: POUGHKEEPSIE, N. Y.

TIPS FOR CENTERLESS GRINDER BLADES *made of*



We are now in position to provide complete re-tipping service on Centerless Grinder Blades.

This service consists of casting tips of Colmonoy No. 6, and applying them to a Mild Steel base by the use of Silver Solder or a low temperature brazing alloy, using special holding fixtures which prevent warpage of the blade.

Charges for this work are moderate, and are given in detail in Bulletin CG-7, together with prices for Colmonoy No. 6 tips that you can apply yourself. Write today for Bulletin CG-7.

Offices in Detroit, New York City, Blasdell, N. Y., Chicago, Tulsa, Los Angeles, San Francisco and in Canada

WALL · COLMONOY CORPORATION

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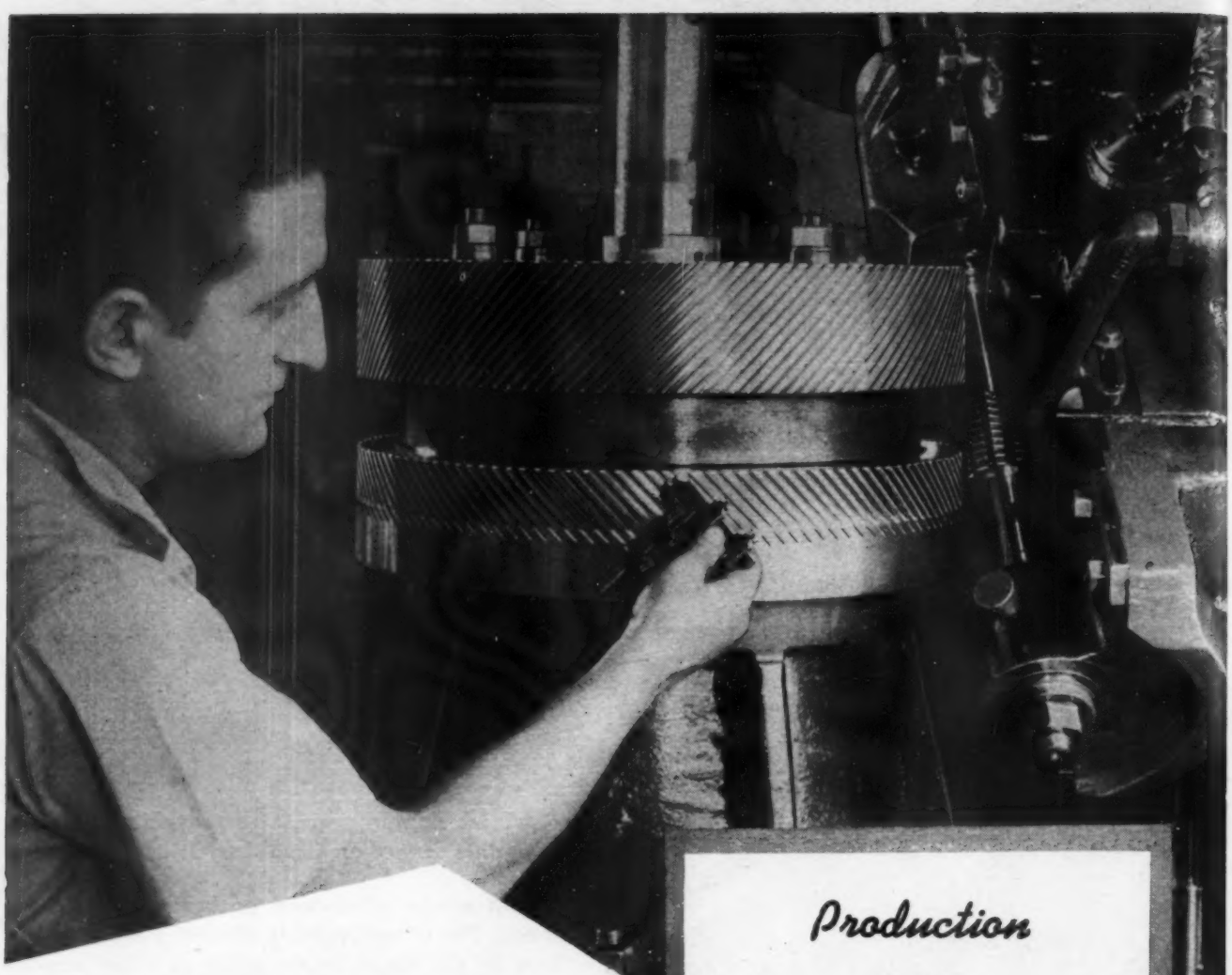


Production of this **SIER-BATH PRECISION GEAR** *required the development of a special machine*

Obviously, a double helical gear for high speed turbine drive must be accurate to an unusual degree and greatest care exercised in checking it through every phase of production to assure the precision demanded.

Sier-Bath was not satisfied that such gears could be produced on a standard machine. The production problem was solved by having a machine specially designed and built to handle this out-of-the-ordinary job. This machine, on the Sier-Bath production line, s turning out these close tolerance gears which meet the rigid specifications called for.

PROMPT SERVICE

In the completely, specially equipped modern Sier-Bath Plant, gears of all types and materials in sizes from 2" to 52" diameter can be produced accurately and promptly.

Ask for a Sier-Bath estimate on your requirements.

SIER-BATH GEAR CO.

9254 HUDSON BOULEVARD — NORTH BERGEN, N. J.

Incorporated

The Doorway to 38 years experience in making Precision Gears

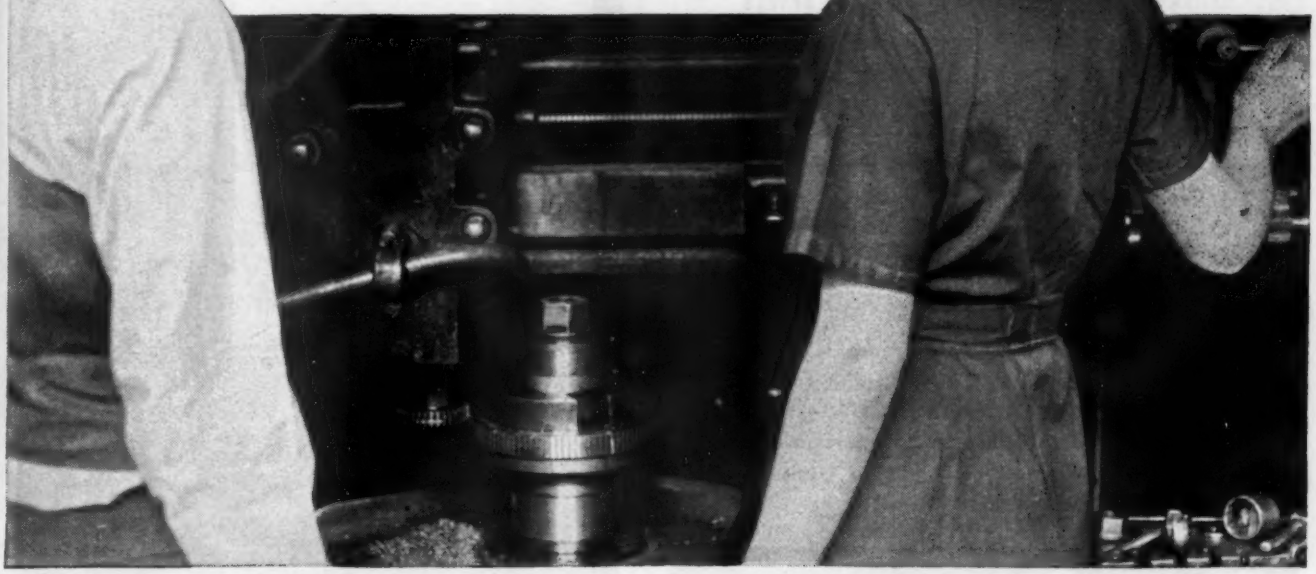
THEY SURELY ARE CAREFUL HERE, ABOUT THE WAY THESE GEARS ARE MADE

. . . AND THAT'S WHY PHILADELPHIA GEARS GIVE SUCH TOP NOTCH SERVICE!

Yes, Philadelphia Gears are given every care in manufacture, from the initial choice of the right materials to the last of the many inspections. Because of this Philadelphia Gears are specified by many leading firms everywhere . . . it's been proven that for long run, trouble-free and efficient operation, Philadelphia Gears are the right choice.

They're made in all types and sizes, so next time be sure to get Philadelphia Gears.

Want our Gear Catalog?



ARMY E NAVY

PHILADELPHIA GEAR WORKS, INC.

INDUSTRIAL GEARS AND SPEED REDUCERS **LIMITORQUE VALVE CONTROLS**

ERIE AVENUE & G STREET
PHILADELPHIA 34, PENNA.
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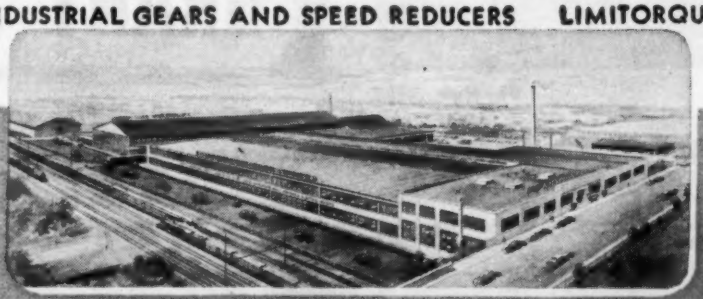
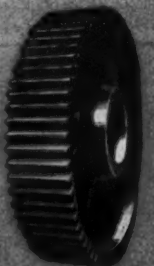
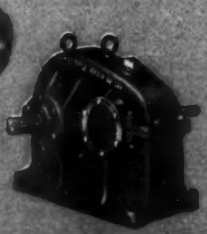


***Philadelphia* LIMITORQUE CONTROL**
operates all types of valves, etc., safely, economically, from convenient stations.



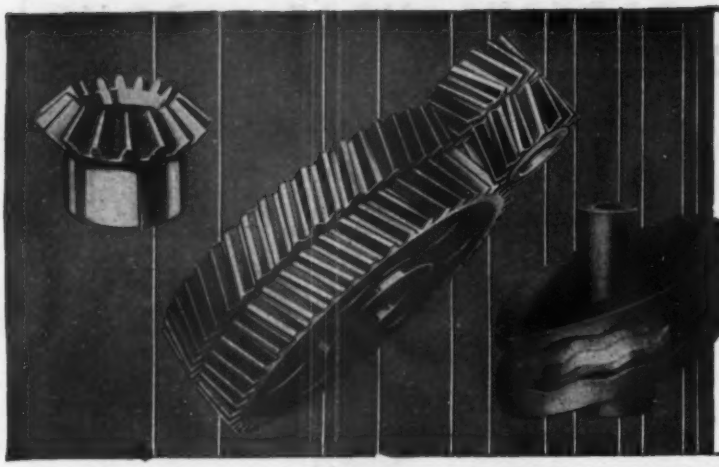
***Philadelphia* GEARS**
All types and sizes of industrial gears. Can be supplied in all materials.



***Philadelphia* HERRINGBONE SPEED REDUCER**
for heavy loads at high speed. Single, Double, Triple Reductions, various ratios and horsepowers.

***Philadelphia* MOTOREDUCER**
The economical self-contained drive. Horizontal or Vertical types — various ratios and horsepowers.

***Philadelphia* WORM GEAR SPEED REDUCER**
right angle drives — vertical or horizontal. Wide range of ratios and horsepowers.



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***from* "HARTFORD"**

GEARS of every description cut to order
GEAR, CAM and THREAD grinding
AERONAUTICAL PARTS on contract basis

Send blue prints or samples for estimate. Accuracy of work guaranteed to your specifications.

THE HARTFORD SPECIAL MACHINERY COMPANY
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Gear Specialties

SPURS • HELICALS • BEVELS
(Straight & Spiral)
WORM GEARING • THREAD GRINDING
(14 to 96 D. P.)

This range logically embraces the gear components of many critical control devices essential to the war effort and this organization is proud of its contributions of such material in the program.

With full *production capacity* scheduled far into the future, all new inquiries are now necessarily subordinated to these vitally important prior commitments. However, every *urgent* need will be given careful consideration.

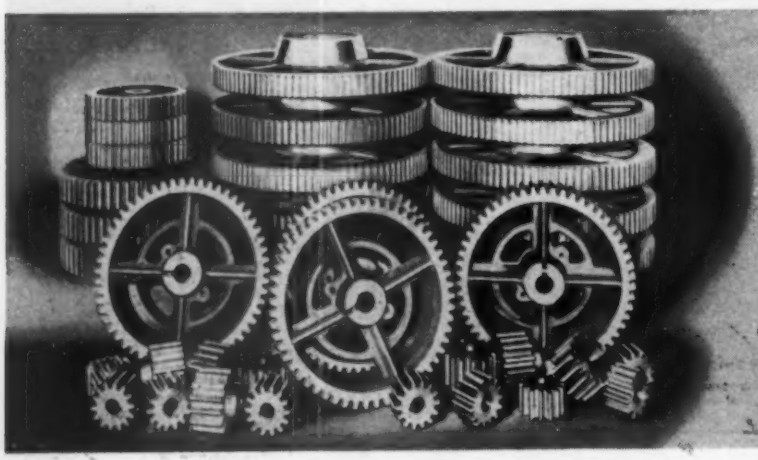
Gear Specialties
MANUFACTURERS
CHICAGO

2600 W. Medill Av. **Ph. Hum. 3402**

"When your specifications call for special gears — Spur — Bevel — Mitres — Helical — Worms and Worm Gears — Reduction Units — Why not try GRANT.

You will find GRANT service meeting all requirements of both stock and special gears."

GRANT GEAR WORKS
BOSTON



ADAMS GEARS

SPUR — HELICAL — WORM
BEVEL — MITER — RACKS

Splined Shafts A Specialty

THE ADAMS COMPANY
Est. 1883
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HERE'S WHAT REEVES MEANS BY *Accurate Speed Control . . .*

1 Any speed—not just step speeds—between predetermined limits, on any driven machine.

2 Any desired speed setting maintained without slippage or fluctuation over entire speed range.

3 Speed changes made easily and quickly without stopping the machine.

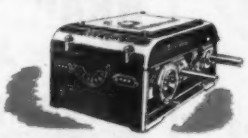
Speed control is a *relative* term. Even the old step-cone and belt-changing method had it to a degree. Gear changers, too, go part of the way. But to have *all* of the advantages of speed adjustability, the variation must be *infinite and accurate*, even to a fraction of a revolution.

Then, and only then, is it possible to obtain exactly the right speed for each job, for each kind of material, for each process. Having this stepless, infinitely variable speed adjustability at the machine operator's command speeds up production, prevents spoilage, and reduces costs.

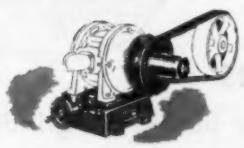
Because REEVES Speed Control has all of these outstanding features of superiority plus dependability, born of specialization in speed control design and manufacture, more REEVES units are in use today than all other makes put together. Let us help you apply accurate speed control to your machines. We maintain a nation-wide staff of seasoned speed control engineers to serve you!

Table to which work is clamped is revolved at exactly the proper rate for fast, uniform down-hand welding because driven through a REEVES *Variable Speed Transmission. This 14,000-lb. capacity welding positioner, manufactured by Cullen-Friestedt, is handling a gear blank for large reduction gears used on steam turbine and Diesel-driven ships.*

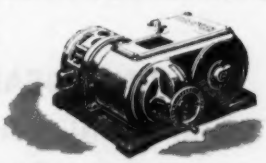
THE *Three* BASIC UNITS IN *REEVES* LINE



VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over wide range—2:1 to 16:1 inclusive. Sizes fractional to 87 h.p. Vertical and horizontal designs.



VARI-SPEED MOTOR PULLEY converts any standard constant speed motor to a variable speed drive. Ratios of speed variation within 3:1. Sizes to 15 h.p.



VARI-SPEED MOTODRIVE combines motor, speed varying mechanism and reduction gears in single unit. Speed variations 2:1 to 6:1 inclusive. Sizes to 15 h.p.

REEVES *Accurate Variable* Speed Control

★ **REEVES PULLEY COMPANY • COLUMBUS, INDIANA**

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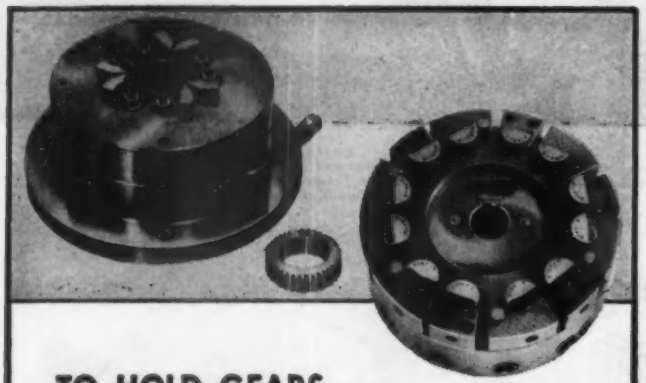

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with precision for boring or grinding
HAVE TEETH GRIPPED ON LINE OF ACTION
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ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips — MEANS MAXIMUM CUTTING EFFICIENCY.
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FOR THE WORLD OF TOMORROW

The revolutionary new or improved products that will loom large on tomorrow's skyline are taking shape today in thousands of laboratories. New lines of engineering endeavor—nebulous ideas yesterday—are taking concrete form under the skilled hands of highly trained Design Engineers. To these engineers, Perkins freely offers the assistance of its engineering staff on any problem involving the use of precision custom-cut gears. Right now, Perkins is right in the thick of the battle—producing gears for the equipment of our fighting forces—gears that are meeting the specifications of our Army, Navy and Air Corps. But it is not too early to inquire about the gear problems for your post-war products NOW.

PERKINS MAKES:

Helical Gears *Bevel Gears* *Ratchets*
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Ground Thread Worms

PERKINS MACHINE & GEAR COMPANY
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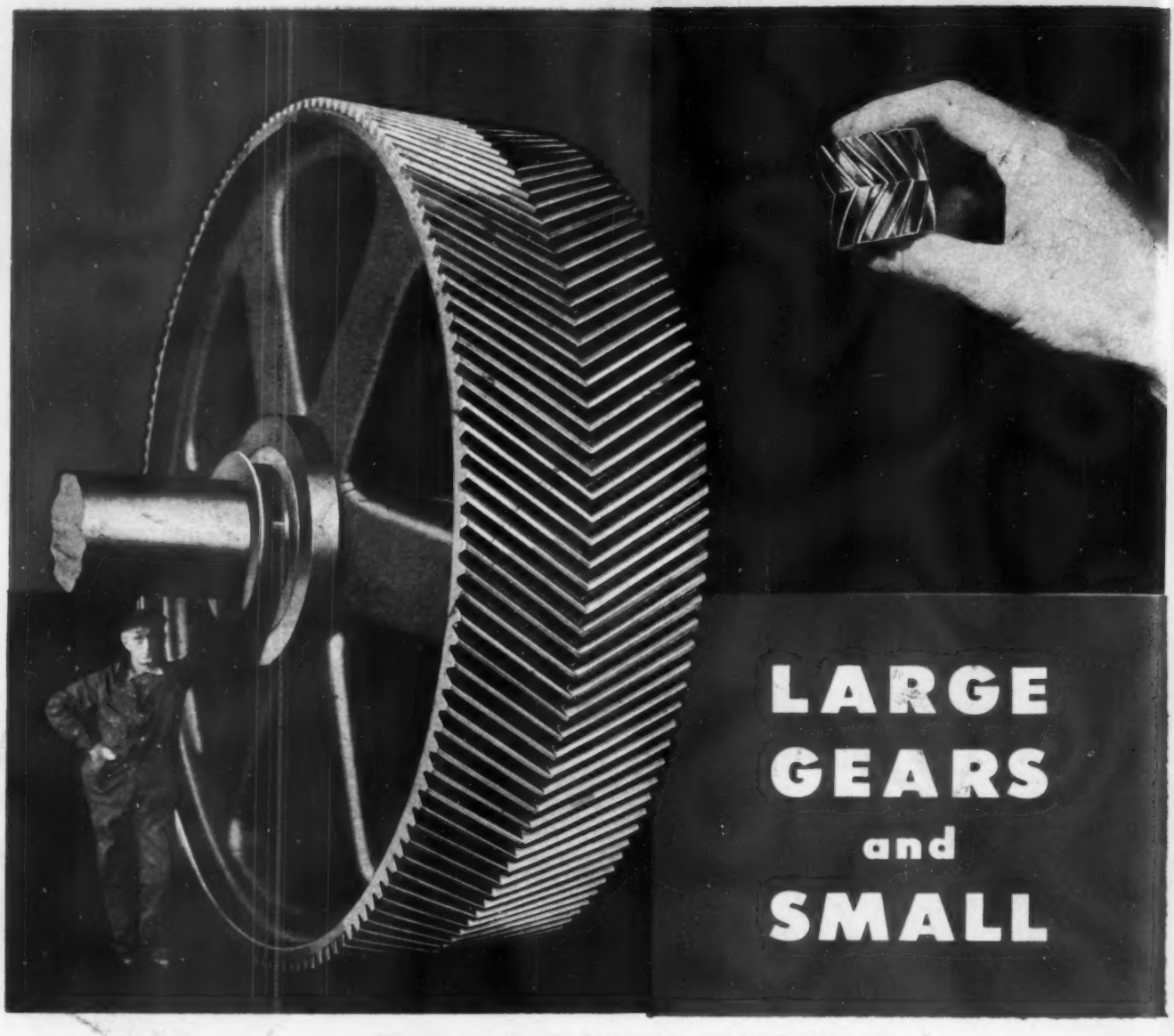

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FARREL-SYKES herringbone gears are made in a complete range of sizes, from ¼ inch to 20 feet diameter, ¼ to 60 inch face, 24 DP to 0.75 DP, and for any power capacity.

Known as *The Gear with a Backbone,* Farrel-Sykes gears have continuous teeth with sharp apices, which give them extra strength and high load-carrying capacity in small space. Combined characteristics of overlap or interlacing of the teeth, gradual engagement, and inclined line of pressure contribute to smooth, quiet operation and maintenance of correct tooth action throughout the life of the gears.

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Our engineers will be glad to assist you in working out unusual gear problems. Many years of experience qualify them as experts in the correct application of all types of gears. Literature and information on request.

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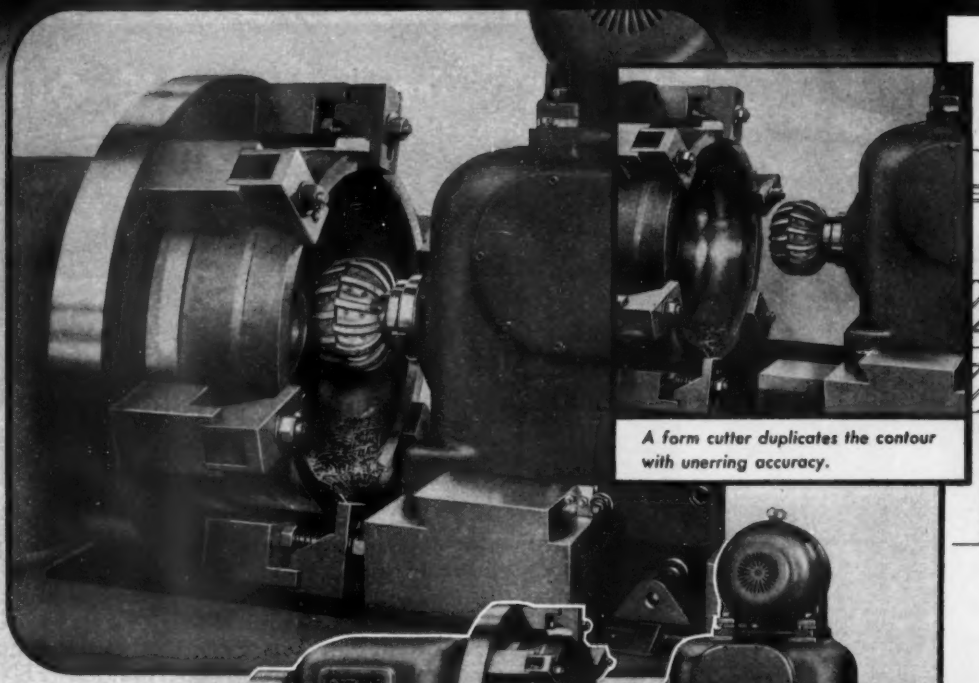
FARREL — The Gear with a Backbone



A form cutter duplicates the contour with unerring accuracy.

CROSS NO 13 *Rotary Milling Machine*

TOP ACCURACY—A GOOD FINISH—1/12 THE TIME is the story of machining Fluid Drive Housings with the Cross Rotary Miller. Automatic operating cycle with centralized push button control enables unskilled labor to achieve maximum results without scrap. Three models for small, medium and large work.

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CROSS GEAR & MACHINE CO.

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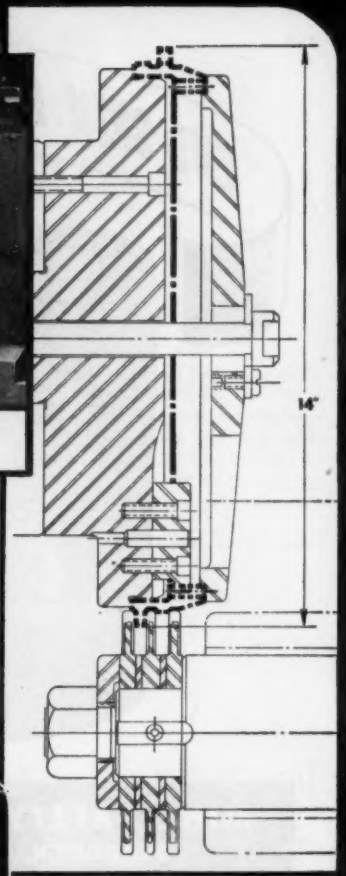
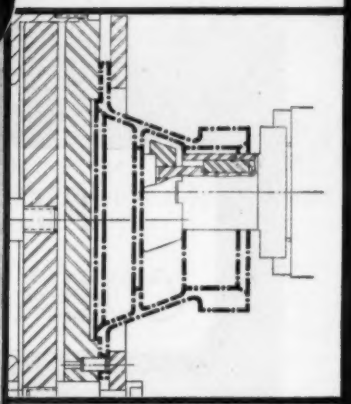
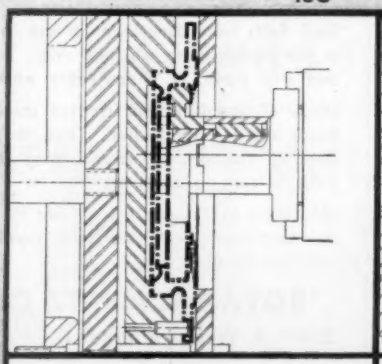


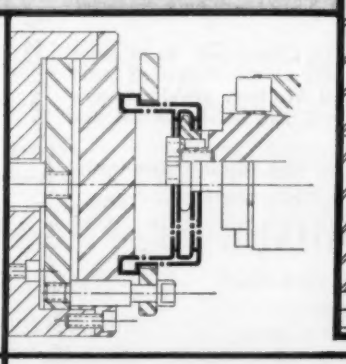
External operations with interrupted cuts are finished to close tolerances with the Cross Rotary Miller.



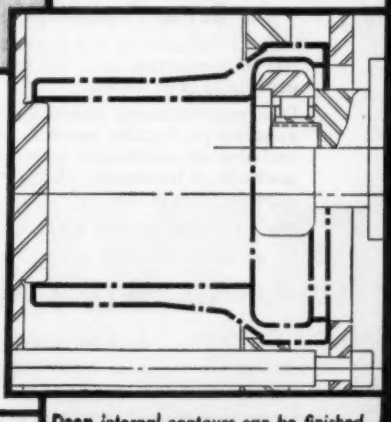
Irregular contours are processed in the usual way without special attachments or tooling.



Rotary milling is an ideal method for handling many difficult operations on aircraft parts.



Multiple edge cutting tools with an enveloping cutting action satisfy the most exacting demands for fine finish.



Deep internal contours can be finished in one operation with the Cross Machine.

END SKIN IRRITATION HAZARDS from CUTTING OILS SOLVENTS and DEGREASERS WITH M·S·A

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BARRIER PROTECTIVE CREAM

Specific protection for the machinist against skin irritations from contact with cutting oils and cooling compounds of low water content—carbon tetrachloride, gasoline, naphtha and other petroleum distillates and chlorinated solvents. FEND-E is easy to apply, rubs in dry on the skin, and is readily removed with soap and warm water at end of work period. Use FEND-E as safety assurance against irritated skin conditions among *your* shop workers!

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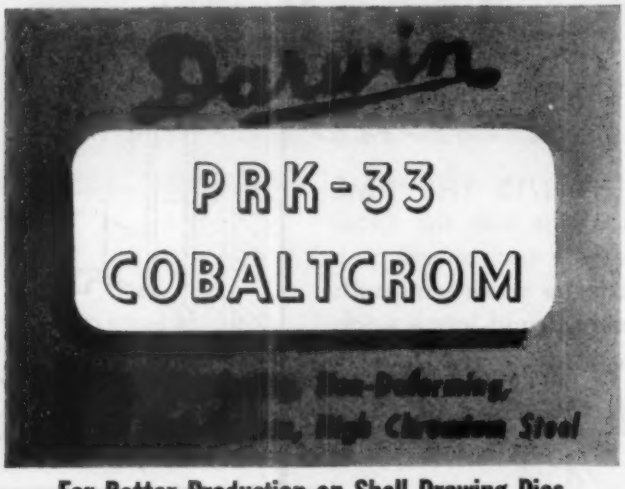
Get the facts on the complete FEND line, plus detailed Application Chart of proper protection against many skin hazards.



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PRK-33 Cobaltcrom has proven itself as an excellent material in connection with the drawing of ordnance material, especially shell cases.

Dies manufactured from PRK-33 Cobaltcrom have given superior production records, both on the steel shell cases and also on non-ferrous material. We have developed new methods of treatment, which will give better die life and superior production runs.

We can ship forged discs and ring forgings promptly.

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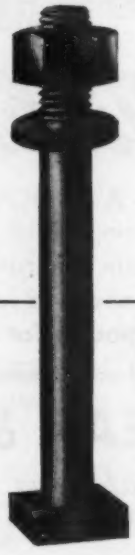

BOYAR-SCHULTZ SMB BOLTS

It is cheaper to use good bolts than to repair the beds of costly machine tools.

SMB Bolts were developed for use in the tool room as well as in the modern busy machine shop. They are tough and strong, and will stand up under heavy working conditions.

Made of specially heat treated steel, they are machined with heads square with bodies. Thus, the heads present a flat surface to the T-slot, safeguarding accuracy of machine and holding work in exact position for heavy cuts.

SMB Nuts and Washers are *made* for use with SMB Bolts. They are heat treated and carefully made with threads cut square with the face of nut.

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For More Than
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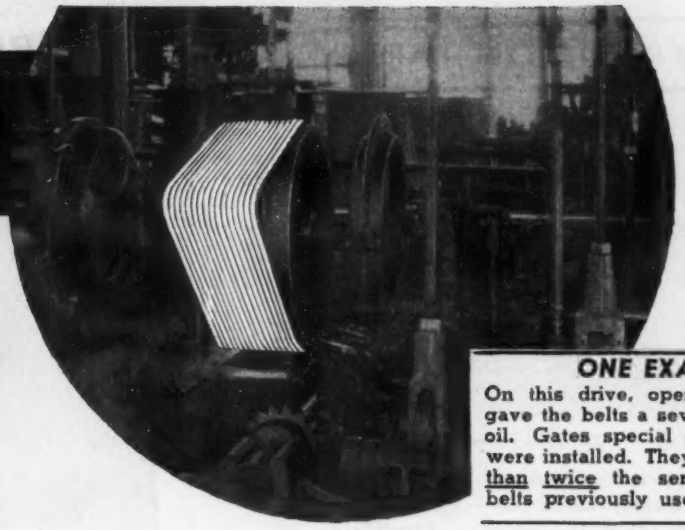

ONE EXAMPLE
On this drive, operating conditions gave the belts a severe soaking with oil. Gates special synthetic V-belts were installed. They are giving more than twice the service life of any belts previously used.

GATES V-Belts *Made Entirely of* *SYNTHETIC Rubber

Have Been Wearing *2-Times* to *3-Times* as Long as ANY *Natural Rubber* Belt on Drives where *Heat* and *Oil* Conditions are *Especially* Severe!

Five years before there was any warning of a rubber shortage, Gates was already supplying American Industry with thousands upon thousands of V-belts made entirely of SYNTHETIC rubber.

***A very special synthetic rubber was chosen by Gates. This synthetic had not been developed as merely a "substitute" for rubber. In certain important applications it is greatly superior to natural rubber. Under severe conditions of heat and oil, for example, the Gates special synthetic V-belt in hundreds of plants is actually outwearing belts of natural rubber by as much as 230%!**

This long record of success in making V-belts of synthetic rubber stands unrivaled in the rubber industry. No other maker of V-belts has had anything approaching Gates' experience and proved success in this field.

This is particularly important to you now. The time has come when Gates' superior "know-how" in the making of synthetic rubber V-belts can be put to work for you right in your own plant.

You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates' knowledge and experience without the slightest obligation.

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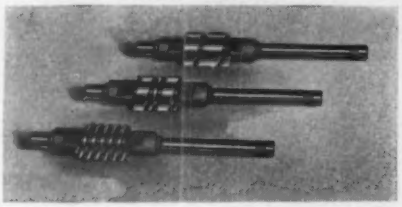
PRECISION PARTS

WORMS

To Bait the Enemy



The worm as turned.

Precision-machined parts for what it takes to destroy the enemy—Ace is turning them out by the thousands. (Ace has an Axis to grind!) These hardened-steel worm-shafts, for example, are part of vital radio equipment. The triple-lead worm-thread is ground right from the solid blank, after hardening. This insures the concentricity between the pitch-diameter of the worm and the bearing-diameter. The bearing-diameter itself is ground to a total tolerance of .0003".

Since the war began, Ace has been supplying America's outstanding manufacturers with small parts and assemblies calling for stamping, machining, heat-treating, or grinding. Ace has provided not only the industry's most modern equipment, but the skill, the background, and the ingenuity to use those machines in new ways to improve results, shorten schedules, and get the work out. Keep Ace up your sleeve for post-war plans. Occasional capacity is available for current work.

Modern equipment . . . modern management.

ACE

ACE MANUFACTURING CORPORATION
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Illustration shows motor driven geared pumps—with exceptionally flexible installation conveniences.

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GEARED-VANE-CENTRIFUGAL MOTOR DRIVEN

PUMP CATALOG SENT ON REQUEST

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BROWN & SHARPE PUMPS

Johnson HAS THE RIGHT ANSWER TO LEAD HAMMER PROBLEMS !

Johnson Lead Hammers with SHUR-GRIP handles. (all sizes in stock)

SHUR-GRIP handles give user a "bulldog" grip . . . prevent costly slips . . . can be reused again and again with 3 to 6 lb. hammer molds. Also 1, 2 and 11 lb. hammers, with tubular handles, in stock.

Johnson Mold & Ladle. Economically priced

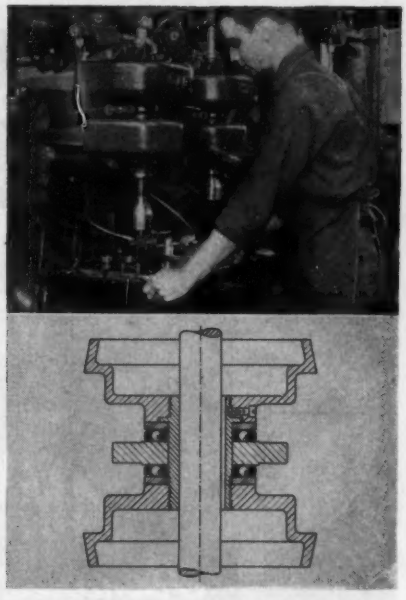
Mold your own lead hammers over SHUR-GRIP handles or plain pipe. Easily operated by inexperienced help. Made in 7 sizes for 1 to 11 lb hammers.

Write to Dept. A for descriptive bulletin and price list.

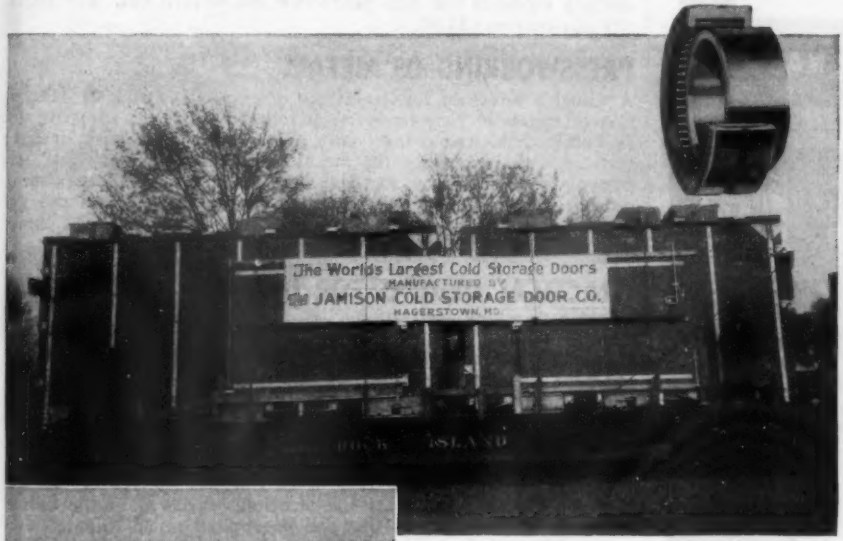
JOHNSON TOOL COMPANY
65 MASSASOIT AVE., EAST PROVIDENCE, R. I.

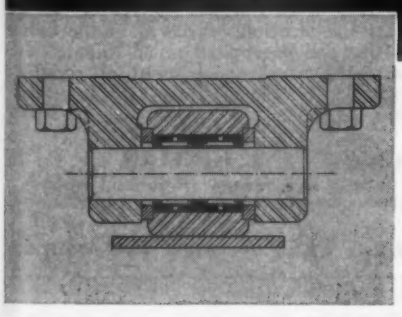
IN THE NEWS
WITH TORRINGTON BEARINGS

NAKED HULLS GROW INTO HUGE PBY Naval Patrol Bombers as they pass along the conveyor system of the production line at the Consolidated Vultee Aircraft Corporation. The hulls are supported on cradle-like dollies which move the ever-increasing load smoothly to its completion while removable sectional platforms provide ready access to the superstructure of the airplanes. To safeguard the vital wheel axles of the conveyor dollies so that the heavy load will be carried steadily and safely and without time-consuming stoppages, the makers of the conveyor system selected Type NCS Needle Bearings for their high capacity and low friction coefficient.

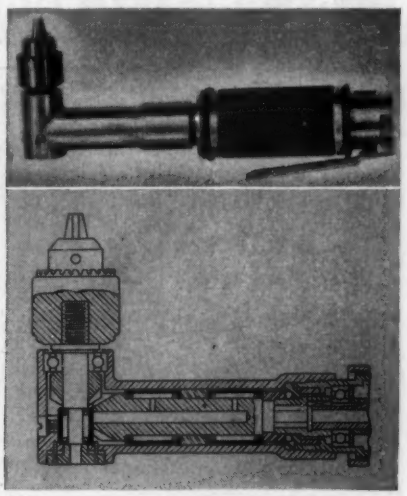


TAPPING OPERATIONS are done swiftly and accurately with this Garvin No. 2-X Duplex Automatic Tapper manufactured by the Western Machine Tool Works. The builders of this machine selected Torrington Ball Thrust Bearings for application on the spindle between the forward and reverse driving friction cones, as shown in the cross-section, because their sturdy construction and high accuracy could withstand the repeated shock loading which the application required.





"WORLD'S LARGEST" are these cold storage doors made by the Jamison Cold Storage Door Company for a 67° below zero cold chamber at Wright Field. To help support and lend ease to the operation of these colossal doors, a Needle Bearing equipped floor roller assembly has been applied to the bottom of the hinge sides, as shown in the cross-section, to provide ease of manual operation.



RIVET HOLES IN TIGHT CORNERS and small openings are easily drilled with this pneumatic angle drill made by the Chicago Pneumatic Tool Company. Because of their small size and high load capacity NCS Needle Bearings were selected to carry the load on the shaft of these compactly designed tools, as illustrated in the accompanying cross-section of the drill.

A COMPREHENSIVE LINE OF STANDARD ANTI-FRICTION Bearings—straight roller, tapered roller, needle, and ball—is offered by the Bantam Bearings Division. For new or unusual bearing problems, the assistance of Torrington-Bantam's engineers is especially valuable. Years of experience in the design and application of special bearing styles stand back of their recommendations. Whenever you need engineering counsel on standard or custom-built bearing types, TURN TO TORRINGTON.

ARMY E NAVY

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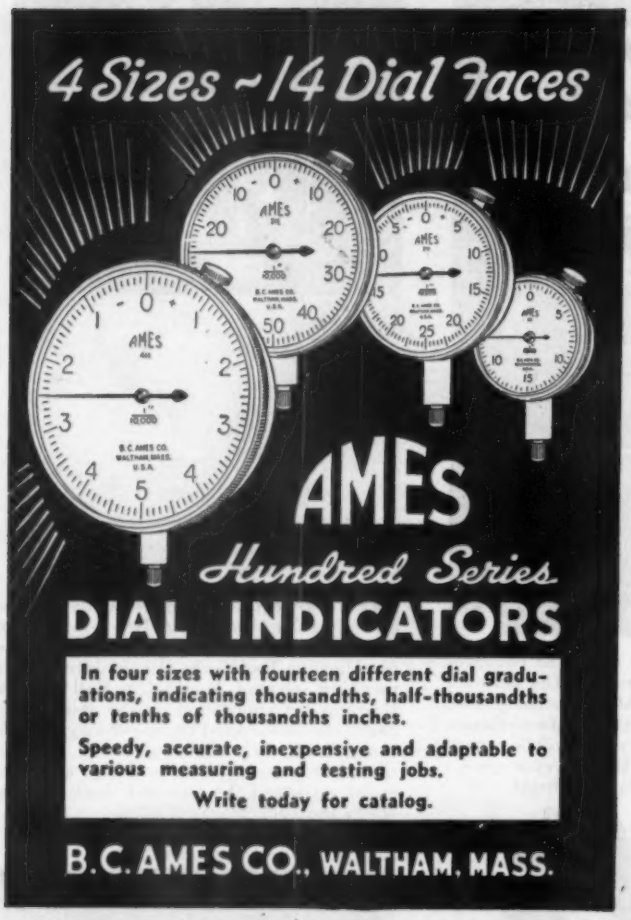
STRAIGHT ROLLER · TAPERED ROLLER · NEEDLE · BALL

THE TORRINGTON COMPANY · BANTAM BEARINGS DIVISION

SOUTH BEND 21, INDIANA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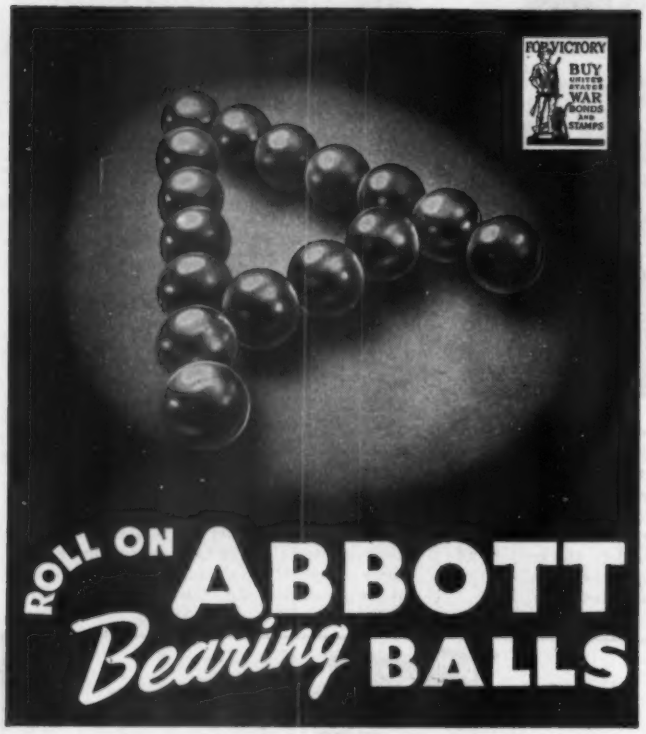
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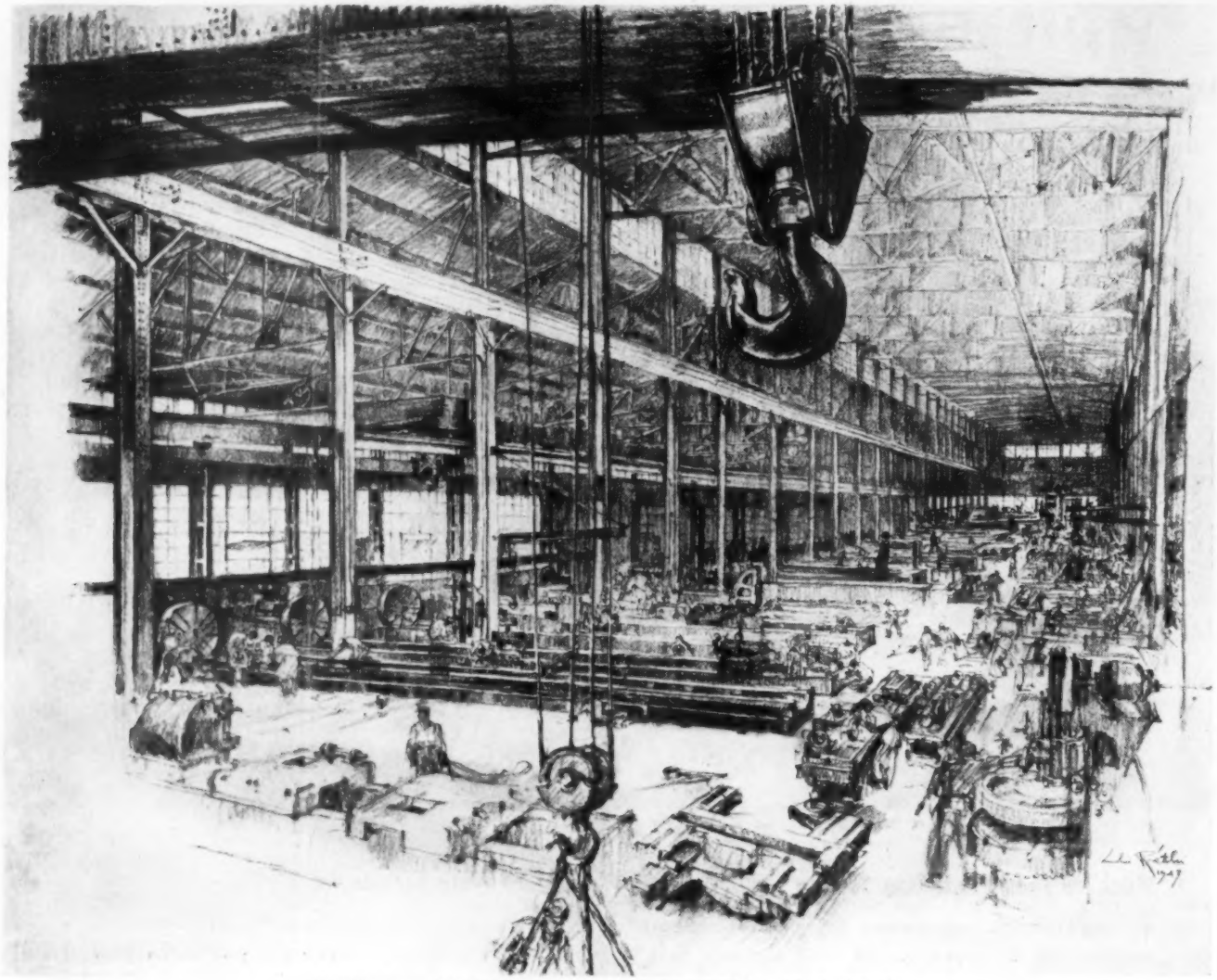
AMERICAN MACHINIST'S 31ST ANNUAL REVIEW NUMBER

THE MASTER TOOLS OF MASS PRODUCTION



Building new 48' Lathes. Drawn at the Simmons Plant by Lili Rethi.

The secret of America's success in mass production lies in the fact that we have been able to create by assembly-line methods the same, careful, well-constructed article as a custom-made one. To do this American industry developed the machine tool to meet the ever-changing demands of our industrial and mechanical expansion.

With the war, greater demands were made, calling for all the skill and ingenuity of the machine tool industry. More and more tools were needed. Today the greatest mass-production program ever conceived is going forward at a staggering rate, constantly and consistently, due largely to the accomplishment of the "impossible" by the machine tool industry.

When you read of mounting war production figures, remember the part played by the machine tool. Remember also that a vigorous machine tool industry is vital to the nation's security—in peace as well as in war.

Simmons builds lathes, turret lathes, planers, milling machines and cylinder boring machines. For over thirty years Simmons has also *Engineered Rebuilt* all types of machine tools.

SIMMONS MACHINE TOOL CORPORATION
1759 North Broadway, Albany 1, N. Y.

SIMMONS *Engineered* REBUILDING

You CAN NOW HAVE your MACHINE REMANUFACTURED

ReMANUFACTURED
-(ORIGINATED BY US)-
MACHINE TOOLS
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Hand screw machines up to 1½ dia.
Turret lathes up to 15" dia.
Milling machines
Engine lathes
Bench lathes
Drill presses
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30 Irving Place, New York, N. Y.
established 1922

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SPECIAL TUNGSTEN CARBIDE TOOL BLANKS

Any Shape, Size or Grade made to order.
10 day Service.

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MACHINE SHOP

Facilities include 9" South Bend Bench Lathe, 22 Brown & Sharpe Milling Machine, Drill Press and 8" x 8" Shaper. The usual line of hand tools and equipment plus experienced workmanship assure your satisfaction. Your inquiries invited.

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For All Kinds of Castings, Large or Small
MATCH PLATE WORK A SPECIALTY

Put your pattern problems up to us – we will take care of them.

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WIRE AND METAL SPECIALISTS
in round, flat, square and special shaped wire in all metals.

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See opposite page for additional Contract Work advertising

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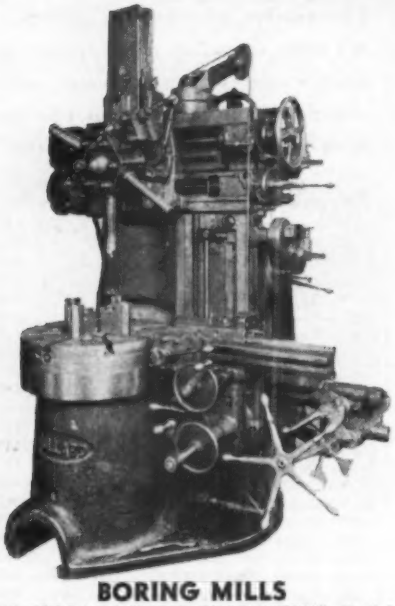


BORING MILLS

24" BULLARD RAPID PRODUCTION; Serial 6620—Vertical Turret Lathe with Side Head, Motor Driven, 3-60-220 Complete. Reconditioned—Immediate Delivery.

8½" Bar, Landis, Floor Type; Floor Plate 120"x72"; Range—60" Longitudinal Travel, 60" Vertical Travel, 26" Spindle Travel at one Setting.

MILLING MACHINES

No. 3 Cincinnati Vertical High Power Miller, Motor Driven; Power Rapid Traverse, Serial A 308-E; Range 34" Longitudinal Travel, 12" Transverse, 20" Vertical; Thoroughly reconditioned; immediate delivery.

AMES Precision Universal Bench Mill.

No. 1½ Brown and Sharpe Universal Mill, Motorized

No. 1 Kempsmith Universal Mill

No. 4 Cincinnati high power plain Miller, single pulley drive

No. 14 Cochrane-Bly Vertical Duplex Miller-Shaper: Single Pulley arranged for motor drive.

No. 1 Cleveland Vertical Miller.

No. 2 Pratt & Whitney Duplex Production Miller, Belt drive and countershaft.

No. 1 U. S. Hand Miller, motor driven.

No. 12 Pratt & Whitney Profiler.

No. 1½ Valley City Plain Miller, belt drive.

PRATT & WHITNEY 2" Spline Duplex Miller

1—No. 3 Cincinnati Plain Miller, single pulley drive, high power. Serial #A-889-H.

1—No. 4 Cincinnati Plain Miller, single pulley drive, high power. Serial #4-335-K.

1—No. 4 Cincinnati Plain Miller, high power. Serial #A-703-D.

1—No. 5 Cincinnati Plain Miller, high power. Serial #4-525-N.

1—No. 5 Cincinnati Plain Miller, high power. Serial #A-603-A.

HAMMERS

High Speed Riveting Hammers, all sizes in stock from 6 A to AA 1.

1100 lb. Niles Steam Forging Hammer.

50 lb. Fairbanks Blacksmith Forging.

15 lb. Bradley upright strap Hammer.

GRINDERS

#2 Cincinnati Centerless Grinder, Serial #H, 2055-Y.

24" x 136" Landis Universal Cylindrical Grinder, motor drive, perfect condition, rare bargain.

Pratt & Whitney 14" x 36" Vertical Surface Grinder, ball bearing spindles, belted motor drive, 10" x 36" magnetic chuck.

No. 2 and No. 3 Brown & Sharpe Cutter Grinder.

16" Rotary Surface Grinder, motorized.

#2 Brown & Sharpe Universal Cylindrical, belt drive.

18" Gordon Disc Grinder, double end, B.D.

12" x 2" New B-line Floor Grinders, 3 H.P., 3-60-220/440.

Arter 16" Rotary Surface Grinder, Motorized 3-60-220 volt.

24" Landis Universal Cylindrical Grinder (as illustrated foot of next column).

GEAR CUTTING MACHINERY

No. 13 Brown & Sharpe Spur & Bevel Gear Cutter.

No. 612 Fellows Gear Shapers, large hole in spindle. Exceptionally fine condition.

PLANERS

POND 72" x 72" x 18' table; 2 heads on rail, 2 side heads.

CINCINNATI 30"x 30" x 10' table, M.D.

PUTNAM 48" x 48" x 12' table, M.D.

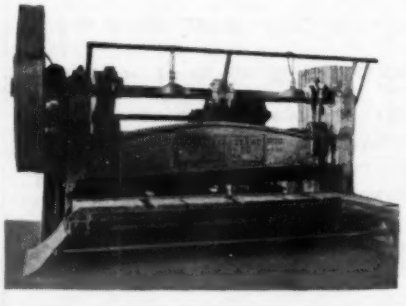
Gray 26" x 26" x 8' Double Housing Planer, single head on cross rail, belted motor drive.

Cincinnati 24" x 24" x 6' table, belt drive, single graduated swivel head on cross rail.

American, 30" x 30" x 12', A.C. Motor Drive, two heads.

156"x5/16" PLATE SHEAR

United Foundry & Engineering Co., 156" x 5/16" Cap Plate Shear, Gap Frame, Motor Drive, Perfect Condition, Warehouse Rochester, Prompt Delivery.



LATHES

LeBlond 21 x 10 Quick Change Gear Lathe, motorized.

Rockford 16 x 6 Quick Change Gear, motorized.

LeBlond 14" x 6' Toolroom Quick Change Gear Screw Cutting Lathe with taper attachment, drawbar collets and two chucks.

American 16 x 8 Quick Change Gear, motor drive.

Seneca Falls 14 x 6 Quick Change Gear, motor drive, taper attachment, collets.

Reed-Prentice 20" x 10' Quick Change Gear, motor drive, taper attachment.

Logan Model #450 Turret Lathe, new, ⅝ capacity, immediate delivery.

26" x 12' PUTNAM Heavy Duty, Quick Change Gears, fitted with Raising Blocks to swing 32"; Arranged for direct Geared Motor Drive.

22" x 16' REED "Light Pattern" Plain Change Screw Cutting Lathe, fitted with 12" 4-jaw chuck, standard equipment. $550.00.

21" x 16' LeBlond, Heavy Duty Quick Change Gear Screw Cutting Lathe, Motorized 3-60-220, Oil Pan, Taper Attachment, Pump, Chuck and Standard Equipment, Rebuilt, Immediate Delivery.

18" x 8' SUPERIOR Heavy Duty, Quick Change Gear Screw Cutting Lathe, 14" 4-jaw Chuck, 3 step cone, double back gears, hollow spindle, standard equipment. Excellent condition.

21" x 8' LeBlond Heavy Duty Geared Head motor driven Screw Cutting, Quick Change Gear, Engine Lathe, with taper attachment, 18" 4-jaw Independent Chuck, standard equipment. Motor Dr.

16" x 6' South Bend Plain Change Lathe, 4-step cone, belt drive, standard equipment.

Fitchburg, LoSwing Lathes 8" x 108". Late type.

10' x 42" Logan New Lathes. $225.00.

18" x 10' bed Rahn-Carpenter Plain Change Gear Screw Cutting Lathe. Fitted with 12" 4-jaw Independent chuck, recently reconditioned. PRICE: $850.00. Shipment from Worcester, Mass.

LANDIS UNIVERSAL CYLINDRICAL GRINDER

Size 24" swing x 136" between centers. Motorized, motors, 3 phase 60 cycle 220-440 Volt. Complete with Tank and Pump. Warranted in first class mechanical condition. Will hold long work to very close tolerances. BARGAIN PRICE. Immediate delivery.

Every Item as Represented

FALK MACHINERY COMPANY

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n DEPENDABLE MACHINES

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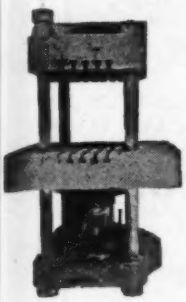
200 TON HYDRAULIC PRESS



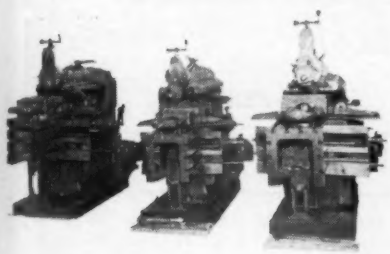
American Car & Foundry upmoving ram; 4-column type; distance between columns 35" right to left, 24" front to back; daylight 34½"; minimum die space 22"; platens are made with 5 tee slots; bottom platen area 49" right to left, 36" front to back; cylinder 13⅛" diameter; 24" stroke; 2500♯ pressure capacity.

TURRET LATHES

Jones & Lamson 3 x 36 Chucking Machine, Serial ♯15,451, single pulley drive with chucks.
Jones & Lamson 3 x 36 Chucking Machine, Serial ♯15,347. Motor Driven with chucks.
Warner & Swasey ♯6 Turret Lathe, power feed to turret, geared friction head, full set of collets, oil pump and piping, steel pan bed, serial over 280,000, perfect condition, available immediately.
No. 6A Potter & Johnson Automatic Turret Lathes.
No. 5A Potter & Johnson Automatic Turret Lathes, motor drive.

SHAPERS

26" Cincinnati Triple Geared Shaper, Friction Drive.
20" x 20" x 36" N-B-P Shaper-Planer, Arranged Motor Drive.
16" Davis Single Pulley Drive thru gear box, with motor A.C. 60 cycle, 3 phase, 220 volt.
24" Gould & Eberhardt High Duty Back Geared Crank Shaper, motor drive, reconditioned.
20" Gould & Eberhardt High Duty Back Geared Crank Shaper, Lima Motor Dr.
20" Back Geared Gould & Eberhardt Crank Shaper, Lima Motor Drive.



9—6-SPINDLE AUTOMATICS—LIKE NEW

New Britain ♯61—1⅝" 6-spindle Automatics—3 equipped for bar work—6 equipped for second operation work. Machines are about 15 months old. Now available for immediate delivery. Equipment includes motors, chucks, collets, and tooling.

PUNCH PRESSES

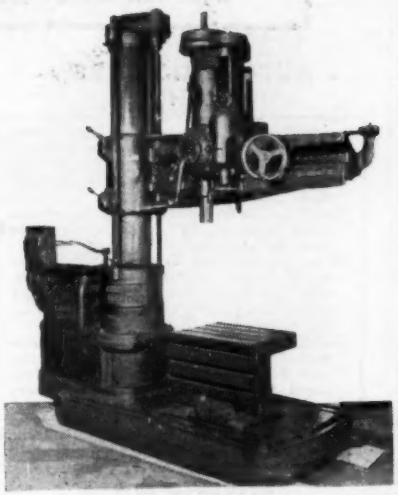
Bliss No. 4 Geared, Back Flywheel Press, 1½" stroke, weight 6000 lbs.
Bliss No. 2K—25-t. Knuckle Joint Coining.
Bliss No. 2 Stiles Type, Plain Flywheel Presses, 1½" stroke, 20 tons pres. (10).
Bliss No. 15N Geared, motor driven, End Flywheel Press, like new.
Bliss No. 30 Arch Press, 2½" stroke, Plain Flywheel.
Bliss No. 216 Consolidated Straight Side, Tie Rod, Plain Flywheel, Double Acting Cam Press, 5" stroke, 100 ton pressure, arranged with roll feed and scrap cutter also coil stock straightening roll.
Niagara No. 3 Open Back Inclinable, Plain Flywheel, weight 1200 lbs.
Consolidated No. 3 Open Back Inclinable Plain Flywheel, weight 1400 lbs.
Baxendale No. 4 Similar to No. 20 Bliss, O.B.I., 2" stroke, weight 2000 lbs.
Bliss No. 62—7" stroke Reducing Press.
Waterbury-Farrell No. 6 Open Back on Inclined Legs, Back Geared Power Press, 1½" stroke, bed 17½ x 24.
Bliss No. 71 Straightside, 25-ton, Wedge adj., Plain Flywheel, 2" stroke.
Blake and Johnson Press for use with sub. Press, Plain Flywheel.
HYDRAULIC PRESSES—200-ton A.C.F.; 100-ton H.P.M.; 25-ton Elmes, 25-ton Watson-Stillman.
Bliss No. 20 Open Back Inclinable Plain Flywheel Power Press, 2" stroke, motor driven, A.C.

BRAKES and SHEARS

D. & K. No. 203 Power Bending Brake, 10' x ⅛ plate, 10' x 11 gauge cap., arranged for M.D.
No. 98 Niagara Power Folder, motor driven, capacity 72" of 14 ga., like new.
Bliss Slitter, 12" throat, 14 ga. cap., No. 232.
Bliss Slitter, 12" throat, 16 ga. cap., No. 132
Torrington Gang Slitter, 30" wide 28 gauge tinplate.
Guillotine Bar Shear—Pels 2½" cap.
Manville ♯4 Perforating Press with roll feeds.
Bliss ♯18 Open Back Inclinable 1½" stroke.

HEAVY PRODUCTION FOLDER NIAGARA ♯98

6' x 14 gauge capacity. Ar. M.D.
Working length 72", cap. 14 gauge; min. width of fold at cap. 1" gaging range (narrow folds) ⅜" to 1⅝", max. gaging range 72" left of chamfering bar 3". Shipping wt. 12,690 lbs. Like new.



CINCINNATI-BICKFORD 4' arm Plain Radial Drill, motor drive thru gear box, 11" round column, No. 5 M.T., oil grooved base with plain box table.

RADIAL DRILLS

BICKFORD 7' PLAIN RADIAL 15" Round Column No. 6 Taper, Motor Driven thru Quick Change Gear Box.
AMERICAN 6' arm 15" round column, gear box drive Plain Radial Drill, No. 5 M.T. spindle.

DRILLING MACHINES—MULTIPLE

No. 15D Fox Multiple Spindle Drill, Hydraulic Feed, fitted with 35 No. 1 M.T. spindles, drilled for 54, motor driven, 10 H.P., 3-60-220; Oil Pump and Piping. 43 x 23 Head.
No. 31D Fox Multiple Spindle Drill, Mechanical Power Feed, 16 spindle fitted with eight, No. 2 M.T., Rectangular head 17 x 34, motor driven by 7½" H.P., 3-60-220, power feed to head, hand adjusted elevating table, oil pump and piping.
Avey four-spindle ♯3 M.T., power feed to each spindle, high speed, ball bearing, sliding head, 24" swing, table working surface 20" x 63", motor driven by 5 H.P. A.C. 60 cycle, 3 phase motor, perfect condition.
Prentice four-spindle ♯2 M.T., high speed, ball bearing Drill, rebuilt.
Henry & Wright six-spindle ♯2 M.T., 7½" overhang, high speed ball bearing, motor driven Drill (2).
Avey No. 2 three-spindle, high speed, ball bearing, sliding head Drill Press, 8" overhang, ♯2 M.T.
Leland-Gifford 2-spindle, No. 2 M.T., high speed, ball bearing Drill Press, motor drive (2).
Allen-single-spindle, high speed, ball bearing, 8" overhang, ♯2 M.T., table working surface 14 x 14.
100-Spindles High Speed Drilling Machines

COMPANY

MERCHANTS

ROCHESTER 5, N. Y.

FALK

Buy from stock

IN STOCK

Bullard Multaumatic, six spindle, 12" capacity, single index type, with six 3-jaw universal chucks and power wrench, motor driven.
No. 5 x 24" Lodge & Shipley Duomatic, with hydraulic tool control, air operated chuck and tail stock, motor driven.
Gleason Spur & Bevel Gear Planer, capacity 96" diameter spur or bevel gears, with full set of forms for 14½° or 20° pressure angle, motor driven.

AUTOMATIC SCREW MACHINES

No. OOG Brown & Sharpe Automatic Screw Machine, ⅜" capacity, motor driven.
Model M Cleveland Four Spindle Automatic Cut-Off Machine, ⅞" capacity, with bar feed, motor driven.
Model G Gridley Four Spindle Automatic Screw Machine, ⅞" capacity, with bar feed, motor driven.
Model A Cleveland Single Spindle Automatic Screw Machine, 4½" capacity, with bar feed, motor driven with four speed A.C. motor and automatic timing cycle.
Model A Cleveland Single Spindle Automatic Screw Machine, 5½" capacity, with bar feed, motor driven with four speed A.C. motor and automatic timing cycle.

No. OO Brown & Sharpe, single spindle
1¾" Gridley Model F, four spindle
⅞" National Acme, No. 515, four spindle

BORING MILLS

148" Betts Vertical Boring Mill, two swivel heads, motor drive.
84" Gisholt Vertical Boring Mill, two swivel heads, motor drive.
72" Colburn Vertical Boring Mill, two swivel heads, motor drive.
60" Bullard Vertical Boring Mill, two swivel heads, motor drive.

No. 21 Lucas Horizontal, Table Type
4" Fosdick Horizontal, Floor Type
5" Niles Horizontal, Floor Type

BROACHES

HO American Hydraulic, Horizontal
XB10 Oilgear Hydraulic, Horizontal
15 Ton Hercules, Vertical

DRILLS

3' Cannedy-Otto Radial, m.d.
4' Mueller Radial, m.d.
No. 310 Baker, single spindle
24" Colburn, single spindle
24" Barnes Camelback, single spindle, tapping
No. 17 Foote-Burt, 2 spindle
Avey Sensitive, 3 spindle
Leland-Gifford, Sensitive, P.F., 3 spdle.
24" Barnes Camelback, 4 spindle, 2 tapping
No. 11 Natco, multiple spindle

GEAR CUTTERS

No. 12 Barber-Colman Gear Hobber
No. 6 Fellows Gear Shaper
No. 7 Fellows Gear Shaper
30" x 10" Maag Gear Shaper
No. 3 Brown & Sharpe Automatic Gear Cutter
15" Gleason Spiral Bevel Gear Generator
No. 10 Lees-Bradner Gear Grinder
30" Rochester Gear Tooth Rounder

GRINDERS

No. 3 Cincinnati Centerless Grinder, motor driven.
No. 16 Blanchard Rotary Surface Grinder, Timken bearing, motor spindle.
No. 3 Bryant Semi-Automatic Hole Grinder, hydraulic feed, motor driven.

22" x 48" Pratt & Whitney Vertical Spindle Surface, Timken Bearing
No. 2 Wilmarth & Marmon Surface
No. 3 Wilmarth & Marmon Surface
30" Diamond Face, 84" Table Travel
No. 3 Landis Universal
6" x 32" Norton Cylindrical
No. 2 Cincinnati Universal Tool & Cutter
No. 12 Brown & Sharpe Universal Tool & Cutter
No. 70 Heald Internal
Wilmarth & Marmon Drill Grinder

LATHES

12" x 5' Hendey, e.d. yoke head
14" x 6' Lodge & Shipley, c.d.
14" x 10' Pratt & Whitney, c.d.
16" x 8' Monarch, c.d.
18" x 8' Sebastian, g.h.
18" x 8' Greaves & Klusman, g.h.
20" x 14' Ames, c.d.
22" x 10' Lodge & Davis, c.d.
36" x 20' Boye & Emmes, g.h.
8" x 60' Fitchburg Lo-Swing, g.h.

TURRET LATHES

42" Bullard Vertical Turret Lathe, New Era Type, with one turret head and one side head, rapid traverse, four table jaws, motor drive.
36" Bullard Vertical Turret Lathe, New Era Type, with one turret head and one side head, rapid traverse, threading equipment, four table jaws, motor drive.
24" Bullard Vertical Turret Lathe, New Era Type, spiral drive, with one turret head and one side head, rapid traverse, threading equipment, three jaw combination table, motor drive.
No. 3H-10 Libby Universal Turret Lathe, geared head, Timken bearing, 10¼" hole in spindle, 29" swing over ways, cross feeding turret, heavy duty taper attachment, 4 jaw independent chuck, motor drive.
No. 4 Ram Type Libby Universal Turret Lathe, geared head, Timken bearing, 2" bar capacity, 20" swing over bed, with chuck, motor driven.
No. 4 Warner & Swasey Universal Turret Lathe, geared head, Timken bearing, 1½" bar capacity, 16" swing over bed, with automatic chuck and bar feed, motor drive.

No. 2 Superior, c.d.
18" Steinle Universal, g.h.
18" Libby Universal, g.h.
21" Gisholt Universal, c.d.
26" Libby Universal, g.h.

MILLS

No. 3 Ryerson-Conradson, s.p.d.
No. 3 LeBlond, c.d.
No. 2 Cincinnati, s.p.d.
No. 12 Brown & Sharpe, c.d.
Gooley & Edlund Type A Briggs, c.d.
Gooley & Edlund Type B Briggs, c.d.
No. 3 Knight Vertical, s.p.d.
No. 2 Kempsmith Vertical Maximiller, m.d.
No. 3 Brown & Sharpe Vertical, s.p.d.
Model C Becker Vertical, s.p.d.
4" Pratt & Whitney Spline

MISCELLANEOUS

Cleveland Gang Punch 1½" x ⅝"
Cleveland Angle Shear 6" x 6" x ¾"
17" Betts Slotter
100 lb. Bradley Helve Hammer
Wicaco Oil Groover
Cochrane-Bly Die Filing Machine
1A Grant Riveting Machine
Pratt & Whitney Design Profiler
No. 2 Garvin Tapper
No. P2 Ferracute Press
15 Ton Lucas Forcing Press, m.d.
No. 8 Eclipse High Speed Furnace

PLANERS

96" x 96" x 25' Detrick & Harvey Openside Planer, with auxiliary column and four heads, ten foot capacity with outer column removed; A.C. motor drive.
72" x 56" x 20' Cincinnati Hypro Openside Planer, with auxiliary column and four heads; reversing motor drive, with rapid traverse. (New in 1939.)
48" x 48" x 12' Cincinnati Planer, with four heads, motor drive.

38" x 38" x 12' Niles Planer, two heads, motor drive.
36" x 36" x 12' Ohio Planer, two heads, motor drive.
24" x 24" x 8' American Planer, one head, motor drive.

SAWS

13" x 13" Peerless Univer. Shaping, m.d.
9" x 9" Peerless Universal Shaping, m.d.
6" x 6" Racine Shear Cut, m.d.
6" x 6" Espen Lucas Cold Cut Hydraulic feed, m.d.

SHAPERS

24" American, s.p.d.
16" American, c.d.
14" Barker, c.d.

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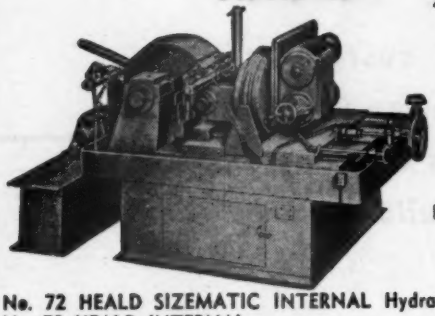
1959-1969 SOUTH MERIDIAN ST.
INDIANAPOLIS, INDIANA

EASTERN BRANCH:
44 WHITEHALL STREET,
NEW YORK, N. Y.

EXCEPTIONAL TOOLS

GRINDERS



2 — PRACTICALLY NEW ZEPHYR Model M-1 Centerless Grinders, Grinding Wheel and Feed Wheel, M.D.
No. 2 CINCINNATI CENTERLESS, M.D.
No. 72 HEALD SIZEMATIC INTERNAL Hydraulic Feed: B.B.
No. 70 HEALD INTERNAL
No. 52 GREENFIELD HYDROIL INTERNAL (2) Hydraulic Feed; Ball Bearing spindle.
34"x10'x6" FARREL ROLL GRINDER, 30" grinding wheel, M.D.
No. 16A BLANCHARD ROTARY SURFACE, 30" fag. chuck.
No. 16 BLANCHARD VERTICAL SURFACE, 26" chuck, M.D.
15" x 15" x 96" NORTON; 2 mag. chucks, M.D., No. 2 W.&M.
No. 3 ABRASIVE MAGNETIC CHUCK.
CYLINDRICAL: 14" x 72" NORTON; 10" x 36" LANDIS.
6" x 18" LANDIS PLAIN, No. 1 LANDIS UNIVERSAL.
BATH UNIVERSAL.
TOOL & CUTTER: No. 1 Wilmarth & Norman.
DISC: No. 24 GARDNER VERT. SPINDLE HORIZ. 53" DISC. B.B.

FLOOR LATHES

16" x 8' and 14" x 6' AMERICAN G.D. HD.
24" x 12 Ft. LEBLONDE, 14" x 6 FT. PRENTICE.
18" x 10 Ft. HENDEY, T.A., M.D.
42" x 18', New Haven, Triple G.D. 10 ft. centers.
2 — 16" x 6 Ft. PRATT & WHITNEYS, G.D. HD.
2 — 16" x 8 Ft. FLATHER; 14" x 6 Ft. FLATHER.
30' PIT LATHE, 156" face plate; 24" x 15' NEW HAVEN.

TURRET LATHES

No. 1-A WARNER SWASEY DG. HD. Univ., bar feed, motor drive.
No. 4 WARNER SWASEY, Univ., Timken bearing, M.D.
11 — JONES LAMSON GEARED HEAD, AC motor drive — 2¼" x 24" and 3" x 24".
4 — No. 6A POTTER & JOHNSTONS. 3—21" Gisholts.
Nos. 2 & 4 W&S, Wire Feed.
No. 3 BARDONS & OLIVER, wire feed.
28" NILES BEMENT POND; 4½" hole in spindle.
No. 16 GISHOLT SIMPLIMATICS, 21" swing.

GEAR MACHINERY

No. 12 BARBER-COLMAN HOBBER. 36" FELLOWS GEAR SHAPER.
No. 36BT G. & E. TURRET BEVEL GEAR ROUGHER.

SHAPERS AND SLOTTERS

2 — 28" OHIO HEAVY DUTY.
20" KELLEY, B.G., M.D., 12" STEPTOE, SINGLE GEARED.
24" & 15" POTTER JOHNSON.
72" MORTON DRAWCUT, 18' TRAVEL.
16" SMITH & MILLS, 15" BEMENT MILES SLOTTERS.

PLANERS

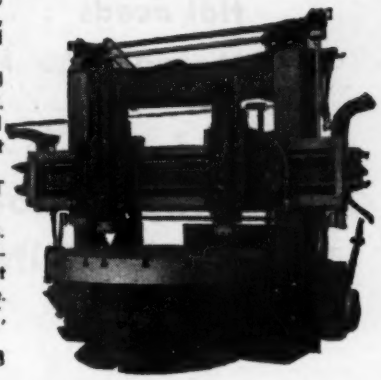
36' SELLERS PLATE PLANER, pneumatic holddowns, M.D.
60" x 60" x 18 Ft. WOODWARD & POWELL, 4 Heads, M.D.
60" x 60" x 18' NILES, M.D., 2 heads on rail.
44" x 36" x 12 Ft. GRAY, 2 heads on rail.
30" x 8' WHITCOMB. 27" x 6 Ft. NEW HAVEN.

OPENSIDE PLANERS.
42" x 45" x 5' LINCOLN.
42" x 42" x 14' PATCH.
42" x 36" x 14' NEW ABLANY.
42" x 45" x 15' BEDFORD.

DRILLS

No. 263 and No. 242 BARNES, sliding head, M.D.
36" BAKER, Heavy Duty, No. 6 M.T. S.P.D.
36", 20", 25" SNYDER; 20" SIBLEY; 34" BARNES.
20" COLBURN Mfg. Gd. Fd. 16" AVEY No. 2 M.T.

VERTICAL BORING MILLS

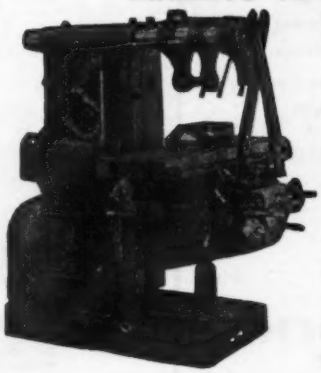


3 — 72" COLBURN, 2 heads on rail, Geared feeds, Rapid Traverse, M.D.
10 FT. POND, 2 swivel heads on rail, M.D.
60" COLBURN, 1 swivel head, 1 turret head, G.D. feeds.
53" NILES BEMENT POND.
51" BULLARD, 2 heads.
48" COLBURN, 1 swivel head, 1 turret head, rapid traverse.
42" & 36" GISHOLT, rapid traverse.
48" ROCKFORD, 3 spindle, M.D.
6" BULLARD MULT-AU-MATIC, 4 stations.

HORIZONTAL BORING MILLS

6" GIDDINGS LEWIS, new 1941, table type.
8" NILES BEMENT POND, Floor Type, Extra High Column.
5" DETRICK HARVEY, Floor Type, M.D.
No. 43 LUCAS, 5" bar, table type.
3½" No. 32 GIDDINGS LEWIS. 3⅛" No. 0 GIDDINGS LEWIS.
3" MORRIS, A.C., M.D. 4" KEMPSMITH, M.D. 3½" BARRETT.
3" LUCAS, M.D. 3½" BEAMAN SMITH. 2½" CLEVELAND.

MILLING MACHINES



PLAIN:
No. 2 CINCINNATI, RECT. OVERARM, New 1940.
Nos. 3 & 2 CINCINNATI.
No. 2-S K&T dble overarm, motor in base.
No. 3 CINCINNATI S.P.D. Hi-Power.
Nos. 4 & 5 CIN. RECT. overarm, rapid traverse.
No. 2-B K. & T. DOUBLE OVERARM, S.P.D.
No. 4 LEBLOND HEAVY DUTY, S.P.D. Vert. H.O.
UNIVERSAL: No. 3 CINCINNATI, S.P.D.
No. 3 CINCINNATI, Cone Drive. No. 3 Kemp.
No. 3 BROWN & SHARPE. No. 1½ HENDEY NORTON
Nos. 1 & 2 KEMPSMITHNo. 1 CINCINNATI
VERTICAL: No. 2½B K. & T. No. 2 BROWN & SHARPE.
No. 3 BROWN & SHARPE. No. 5B BECKER.
THREAD MILLS: 6" x 48", 6" x 72" PRATT & WHITNEY.
No. 3 LEES-BRADNER.

PRODUCTION:
24" and 18" CINCINNATI AUTOMATICS, M.D.
10" PRATT & WHITNEY SEMI-AUTO.
No. 45 PRODUCTOMATIC—BILTON CAM MILL.
2" PRATT & WHITNEY DUPLEX SPLINE MILL.
PLANER TYPE & SLAB:
44" x 40" x 10' INGERSOLL; Adjustable rail; 4 heads.
42" x 42" x 13' INGERSOLL SLAB; 1 vertical head; M.D.
42" x 12'3" INGERSOLL; 2 side heads; 1 vertical head.
BEAMAN & SMITH OPENSIDE; 1 vertical head, 1 side head.

INTERSTATE MACHINERY CO., INC.
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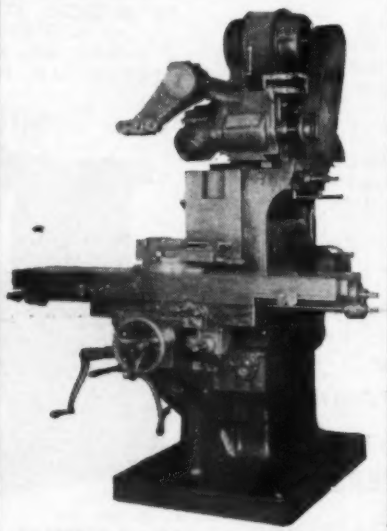
MILLING MACHINES

3 — #32 Van Norman, Late Type.
1 — #2B Milwaukee motor in base.
1 — #2B Milwaukee motor drive.
1 — #2B Milwaukee Universal.
2 — #4 Cincinnati High Power.
1 — #2 Cincinnati High Power.
3 — #2 Cincinnati, Geared Feeds.
1 — #1 Cincinnati Universal.
1 — #1 Cincinnati Plain.
1 — #0 Cincinnati Plain.
1 — #13½ Garvin, Plain.
1 — #13 Garvin, Plain.
1 — #3 Garvin, Duplex.
1 — #3½ Fox, M.D.

TURRET LATHES and SCREW MACHINES

1 — 4½"x26" Libby Geared Head.
1 — 4¼" Bar Cap. Bardons & Oliver.
1 — 3" Bar Cap. Pratt & Whitney.
1 — #4 — 1½" Cap. Warner & Swasey Universal G.H.
1 — 2¼" Bar Cap. Millholland, Bar Feed.
1 — 1½" Bar Cap. Southworth, Bar Feed.
1 — 1½" Bar Cap. Windsor, Bar Feed.



#32 Van Norman Miller

3 — #1 Warner & Swasey — 1½" Hollow hex. saddle type.
2 — #2 Warner & Swasey — 1" Thread Chasing att.
1 — 1" Cap. Southworth.
1 — #7 Bardons & Oliver 2¼" Bar Cap.
1 — #0 Brown & Sharpe, Wire Feed.

1 — #00 G. Brown & Sharpe Automatic.
2 — #00 Brown & Sharpe — Cut-offs.
1 — 6 spindle New Britain — 1⅛"x7".

BORING MILLS and RADIAL DRILLS

1 — 54" Colburn Vertical, 2 Heads.
1 — 42" Baush Vertical, 2 Heads.
1 — 4" Bar Bickford Horiz.
1 — 5 ft. Arm Cincinnati-Bickford Radial.
1 — 4 ft. Arm Cincinnati-Bickford Radial.
1 — 6 ft. Arm Niles Universal.
1 — 4 ft. Arm Fosdick.

MISCELLANEOUS

1 — 11" Gleason Bevel Gear Generator.
1 — 16"x60" Modern Plain Grinder.
1 — 14"x6' Hendy Tool Room Lathe.

•

SHAPERS — LATHES — DRILL and POWER PRESSES

•

We Buy and Sell Complete Plants or Single Tools

★

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WE'VE WORKED "'ROUND THE CLOCK" BEFORE

...and we can do it again for *you*...if necessary

WHEN time is working against you and machine deliveries threaten to bottleneck operations, let O'Brien "round the clock" service put you back on schedule.

Here's one example. A troop transport was leaving New York harbor on a specific date. A 75 KW special motor generator set had to be converted from 230 volt to 125 volt and delivered to the ship before it sailed. Nothing was obtainable to meet the specifications but—they called on The O'Brien Machinery Company for help. Here's how the problem was worked out. O'Brien men worked "round the clock". A generator was taken off one set in the O'Brien stock, a motor from another. A suitable base was made and all of the equipment was rebuilt and delivered to the ship in six days.

You may not need such service today or ever. You can never tell. But it's just one additional reason for depending on O'Brien. Remember it. Remember, too, that O'Brien rebuilt means okay in every way and guaranteed.

MACHINE TOOLS

BORING MILL—
48" Gisholt, vertical, 1 swivel head, 1 turret head, Q.C. M.D.
GEAR CUTTERS—
#4 BROWN & SHARP, 36"x10" cap., S.P.D. like new.
GRINDERS—#2 DIAMOND, surface, 16"x36". Mag.ch., M.D.
#2 BROWN & SHARP, univ., cyl., 12"x30", Excello int. attach.
LATHES—36"x12' DRAPER, chuck, cam attach., belt
32"x22' BRIDGEFORD, geared head, 15 speeds, S.P.D.
24"x10' BOYE & EMMES, DBG, q.c., taper att.
20"x22' REED-PRENTICE, geared head, 17' c/c, taper att.
18"x8' SIDNEY, q.c., DBG, motorized
18"x8' HENDEY, q.c., yoke head, scroll attach.
16"x8' LEBLOND, q.c., drop lever feeds, motorized
12"x6' HENDEY, q.c., yoke head, pan
MILLING MACHINES—#2 ROCKFORD, plain, q.c., m.dr.
#2 VAN NORMAN, duplex, 44"x10" table, motor drive
#1½ BROWN & SHARP, universal, q.c., motorized
#O BROWN & SHARP, plain, p. f. belt dr.
PLANERS—36"x36"x10' GRAY, extra heavy, 3 heads
30"x30"x8' GRAY, spiral drive, 2 heads, motor drive
RADIALS—7' DRESES, 17" col., univ., M.D.
5' Niles, 13" round col., semi-universal.
4' BICKFORD, 11" col., motor drive

POWER PLANT EQUIPMENT

MOTOR GENERATOR SETS

250 K.W. Gen. Elec. MPC 250 V. 3/60/2300/1200 RPM Synchronous.
500 K.W. G. E. 3 Unit Set 250 V. 700 H.P. 3/60/2300/1200 RPM Drive
200 K.W. Crocker Wheeler 250 V. 2 or 3/60/2300/900 RPM Synchronous
75 K.W. Gen. Elec. 250 V. 3/60/220/900 RPM Syn. Drive
50 K.W. Gen. Elec. 125 V. 3/60/2300/720 RPM
40 K.W. West. 125 V. 3/60/220/1200 Syn.

New 1929 . . . used 3 months, 500 KVA Westinghouse Turbo Non-Condensing Generator. 3/60/480 Volt Geared 6000/900 RPM, 150 lb. ISP 5 lb. B.P. direct connected exciter, all accessories on foundations, Phila. Desire to move by January 29. Prints, specifications on request—subject prior sale.

TURBO GENERATOR SETS

2—5000 K.W. West. 3/60/2300/3600 RPM Condensing
2—5000 K.W. G. E. 3/60/2300/3600 RPM Condensing
3—500 K.W. G. E. Bleeder 3/60/240/3600 RPM

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Converting inefficient machines into VOLUME PRODUCERS

INDUSTRY LOOKS TO BOTWINIK FOR REBUILT MACHINERY

LATHES

1—Ledge & Shipley 20"x8' QCG Engine Lathe—M.D. with Pan Bed.
1—Johnson 30x24 Triple Geared Lathe.
5—Wickes 31"x11' Semi-Automatic Crankshaft Lathes Arr. for M.D.
1—Prentice 18"x12' Cone Type QCG Lathe, 83" between centers.
35—Reed-Prentice 14"x6' Plain Turning Lathes with taper attachments.
1—18"x9' Greaves-Klusman Engine Lathe 53" between centers.
1—Monarch 14"x6' QCG Engine Lathe.
1—Ledge & Shipley 20"x8' 12 speed head, M.D., pan bed.
1—Flather 20"x12' Engine Lathe, M.D.

TURRET LATHES

1—Jones & Lamson 3¼"x36" cap. Chucking.
1—Jones & Lamson 2¼"x24" Chucking.
1—3" Acme M.D. Flat Turret Lathe.
1—Pratt & Whitney 2½"x26" Turn Table.
1—Foster No. 6 Geared Friction Head Turret Lathe, 2" capacity.

AUTOMATIC SCREW MACHINES

3—1¼" 4 spdle. Gridleys, M.D.
1—Cleveland 2" Model B, Automatic.
2—Cleveland Model B ⅝" Screw Machines.
1—Brown & Sharpe No. 1 Hand Screw.

PLANERS

1—30"x30"x10' 2 head Powell M.D.
1—Cincinnati 36"x36"x20' 2 head M.D.
1—72"x72"x18' Pond 4-head Planer.

PRESSES

3—General Mfg. Co. No. 203 20-Ton Flexible Press Power, arr. for M.D. Oversize tables.
3—Waterbury-Farrel Single Action O.B. re-Draw Presses with dial feeds, 6" stroke. Weight 4000 lbs.
3—Bliss No. 58 Open Back Single Presses.

GRINDERS

Heald No. 70A Internal Grinder, M.D.
Heald No. 23A Hydraulic Surface Grinder 30" capa.
1—Springfield 30"x30"x48" capacity surface Grinder, M.D.
1—Landis 10"x72" Plain Main Line Grinder Hydraulic in feed. Motorized.
1—Norton 15"x15"x96" Openside Surface Grinder with magnetic chucks M.D.
1—Landis No. 1 Universal Grinder. Swing 10", between centers 20".
1—Norton 6"x32" Grinder.
1—Bryant No. 24 Hydraulic Deep Hole.
1—Heald No. 50 Internal Grinding Machine Hydraulic Cylinder.
1—Woods No. 4 1½" Friction Head.

MILLERS

1—No. 4 Cincinnati Vertical Milling Machine. Table working surface 64½"x16½". Size overall 66¼"x16½". Range: Longitudinal 42", cross 15". End of spdle. to top of table 22". Range spdle. speed 14 to 350. Table 29"x9".
5—Becker No. 7H Millers, Lincoln Type. Table 29"x9".
1—Becker Model C, Table 55x14".
1—Henley Duplex Milling Machines, Arr. for M.D. Table 48¼"x13".
3—Kempsmith No. 32 Lincoln Type Production Milling Machines.
1—6x48 Pratt & Whit. Thread Miller M.D.
1—36 Horizontal Cincinnati Milling Machine, working surf. 55¾"x13½". M.D.
1—B. & S. No. 1 Plain Miller Table Working Surface 42¾"x12".

DRILLS

1—6' Cin.-Bickford M.D. Radial Drill.
1—4' Cin.-Bickford M.D. Radial.
1—Cin. 24" Upright M.D., Tapping Attach.
1—Natco 14 High Speed, Mult. Drill 16"x24" Rect. Head, arranged for 22 spdle. M.D.
1—Henry & Wright Type A 12" Overhang Sensitive Drill.
1—Fosdick Machine Tool Co. 5' M.D. Full Univ. Radial Drill.
1—Reed-Prentice 2-Spdle. Ball Bearing Sensitive Drill Morse No. 2.
1—Taylor & Finn 2-Spdle. Type "H" Drill No. 2 Morse Taper.

HAMMERS

1—E. W. Bliss 600-lb. Board Drop Hammer.
1—Bradley 80-lb. Rubber Cushioned Helve.
2—Bradley 40-lb. Rubber Cushioned Helve.
1—Chambersburg 600-lb. Double Frame Steam Hammer.

MISCELLANEOUS

1—Robertson Power Saw 24, 9"x9" cap. M.D.
1—Gisholt Univ. Type Precision Balancing Machine, Special Long Frame and bed 28" diam. x 72" long, with Gisholt Recording Amplimeter, M.D.
3—Gisholt Balancing Machines, 24"x34" Type C.
1—W. W. Sly No. 00 Sand Blast Outfit, 32" diam. x 48" sand tank.
1—Napier Model B 10x10 Metal Band Saw.
1—Baker No. 1 Keyseater.
1—3" Ajax Upset Forging Machine.
1—Pfauter Automatic No. 2 Universal Gear Hobbing Machine.
3—Brown & Sharpe No. 3 28" Cap. Spur Gear Cutters, M.D.
1—⅛" Capacity Schuster Wire Straightener 4' Cut-Off.
1—No. 13 Bevel & Spur Gear Cutter, M.D.

Our Engineering Department, in making changes on obsolete machines, convert in many cases from mechanical action to hydraulic operations. Our rebuilding service is available for rebuilding of turret lathes, chucking machines, internal and external grinders, radial drills, milling machines, engine lathes, planers, boring mills, forging machines horizontal and vertical—as well as other metal working machines.

Send us your inquiries and we will gladly furnish you with a list of nationally known manufacturers whom we have been serving for a number of years.

Note a completely rebuilt Heald Rotary Surface Grinder, illustrated, equal to a re-manufactured machine for accuracy and performance.

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2 SHERMAN STREET WORCESTER 1 MASS.

AWAITING YOUR ORDER

CHUCKERS AND SCREW MACHINES

1—B-1½ Billings & Spencer Bar Stock Di-matic.
1—1"x5" New Britain, 6-spindle.
1—Model J, 2½" Gridley, S.S.
1—Model G, 2⅝" Gridley, 4-spdl.
2—No. 00 B.&S. Turret Formers.
1—No. 23 Prentice Chucker.
1—No. 2 B.&S. Auto.

MILLERS

1—Pratt & Whitney 2" Duplex Spline.
1—Nube Precision Automatic Die Sinking and Copying Machine, Motor drive, with motor.
1—Newton 2-Spindle Profiler.
1—Holden-Morgan Thread Mill.
1—No. 3 Becker Vertical.
1—Leland-Gifford 1-Spdl. Profiler.
1—48" Ohio tilted offset Rotary.
1—No. 4 Cincinnati Vertical.
1—No. 2 Cincinnati Plain.
1—No. 2 Cincinnati Vertical.
1—No. 1½B Kearney & Trecker Universal.
1—Ingersoll 4 spindle Duplex.
1—Ingersoll 4 spindle Profile.

PRESSES

1—6-ton Fox Forcing Press.
1—15-ton Metalwood Hyd. Pneu.

HAMMERS

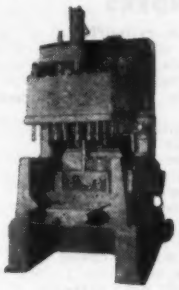
1—600-lb. Erie Single Frame Forging.
2—80-lb. Bradley Helve Hammers.
1—40-lb. Bradley Helve Hammer.

GEAR MACHINES

1—3 Spindle Gleason Bevel gear rougher.
1—36" Fellows Gear Shaper.
1—Cimatool Gear Burnisher.
1—3"Gleason Bevel Gear Generator.

GRINDERS

2—Wet Grinders, M.D.
1—Type P-4 Oliver Die Filer.
1—No. 6 Bryant Internal.
1—Pratt & Whitney 14", Vertical Surface, B.B. Spindle.
1—Foster Superfinisher.
2—Landis 3" Ball Race.
1—Springfield Gage.



(Actual Photo)

1—Greenlee 2 - way Opposed Hydraulic Multiple Drill, area of heads, 23"x30"; motor drive, with A.C. motors.

1—6' Western Radial.
1—2-Spindle Allen 15" H.S.
1—3-Spindle Allen 15" H.S.
1—No. 12 Natco Multiple.
1—No. 11 Natco Multiple.
1—Single Spindle L. & G. Drill, 24" Hyd. Feed.
1—3-Spindle Reed Drill Press.
1—16" Fox Sensitive.
1—Western 6-Spindle Mult. No. 3 M.T.
1—6-Spindle Barr, No. 2.
3—Greenlee 2-Way Opposed Hyd. Mult. Drill.
1—Greenlee Single End Horiz. Mult. Drill.
1—Greenlee Vert. and Horiz. Hyd. Mult. Drill.
1—6' American, Triple Purpose.
1—5' Western Radial.
1—3' Fosdick Radial.
1—No. 17 Foote Burt 5 spindle Rail Drill.
1—4 spindle No. 12-D Moline Hole Hog.
1—No. 25 Foote Burt.
5—No. 314 Baker Heavy Duty.
1—No. 3—24" Defiance, H.D.
1—3-way Greenlee Hydraulic.
1—No. 263 Barnes Camelback.
1—26" Aurora Upright.
1—40" Dreses Upright.

BORING MILLS

1—5" Detrick & Harvey Horizontal Boring and Drilling Machine.
1—5" Beaman & Smith Horiz. Floor.
1—No. 1 P. & H. Horizontal, Floor Type, with motor.
1—Bullard Auto, 4 chucks, 10".
1—60" Niles Vertical.
1—51" Niles Vertical.

LATHES

1—3"x36" J. & L. Turret.
1—19"x8' LeBlonde, turret.
2—6A Potter & Johnson Turret.
1—34" Gisholt Turret.
1—13"x6' Coulter Threading.
1—No. 9 Bardons & Oliver Turret.
10—No. 601 Oster Turret.
1—No. 1H Libby Turret.
1—30"x20' Niles H.D. Forging.
1—42"x16" Putnam Lathe.
1—60" Prod. Lathe; front and rear slides.
3—Gisholt Simplimatics.
1—2¼" Acme Turret.
1—27"x25' American Engine.
1—56"x21' Johnson Engine.
1—No. 4F Foster Fastermatic.
3—20"x6' Reed Prentice Production.
1—8"x108" Lo-Swing.

PLANERS

1—36"x36"x12' Cincinnati, 3 Heads.
1—36"x36"x14' D. & H. Openside.
1—42"x42"x16' Pond, rev. m.d.
1—42"x42"x12' Cincinnati, 4 Heads. Reversing D.C. Motor Drive.
1—60"x48"x12' Pond.
1—60"x48"x12' Gray, 3 Heads.

SHAPERS

1—36" Morton Draw Cut.
1—24" Gould & Eberhardt.

SAWS

1—Higley Cold Saw, No. 14; cap. 7".
1—6"x6" Racine Hack.

MISCELLANEOUS

1—Baker No. 3 Keyseater.
3—Hanna Pneumatic Riveters.
2—Sleeper & Hartley Spring Knotters.
1—No. 6 Whiting Punch & Stake Riveter.
1—Teer, Wickwire Automatic Burr Cutter.
1—Type C Olsen Static and Dynamic Balancer.
3—No. 22 Murchey Bolt Cutters, D.H. M.D.
1—3A High Speed Hammer.
1—18" Gisholt Static Balancer.
1—No. 3A La Pointe Broach.

MDNA MEMBER

MACHINE TOOLS
DONBERG DANITS

400 S. CLINTON ST. WABASH 0123 CHICAGO 7, ILL.

WE STILL HAVE A LARGE STOCK OF QUALITY TOOLS READY FOR PROMPT DELIVERY

AUTOMATICS

1" Cleveland Model J double end
1¾" No. 55 National Acme 4-spindle
1¾" New Britain 6 spindle
4½" Gridley Model H, 4 spindle chucking
7" Baird 6 spindle chucking
14" x 19" Fay chucking
No. 16 Gisholt simplimatic

BROACHES

2 ton American vertical hydraulic
No. 3 J. N. Lapointe double
No. 4 J. N. Lapointe

COMPRESSORS

427', 14" x 14" x 16" Chicago Pneumatic tandem steam driven
550', 11" x 11⅛" National 3 cylinder vertical, motor drive.
1400', 20" x 12" x 14" Sullivan class WN3 angle compound, motor drive

DRILL PRESSES

20" Barnes all geared self oiling
20" Cincinnati, stationary head
20" Champion, BG, PF.
42" SC & H elbow arm post radial
Edlund 2 & 3 way machine using No. 62 unit heads
Kingsbury two way drill (No. 18 heads)
No. 430 Barnes heavy two way.
Nos. 15½, 15½D, 15½F Foote Burt production drills
Foote Burt 3 way drill

DRILLS, SENSITIVE

Allen, 12" type B bench
Avey, 12" No. ½; 15", No. 1; 15", No. 2; motor on spindle units.
Buffalo, 13½" bench
Canedy Otto, 14" High Speed bench
Demco, 16" Model DA bench
Edlund, 14", No. 1B; 16", No. 2B; 16", No. 2 B two spindle; 16", No. 2B four spindle, power feeds.
Fosdick, 13", three spindle "Superspeed" bench
Henry & Wright, 10" class O bench; 14" two spindle; 16" class K; 16" class B; 16" class B two spindle; 24" class I, two spindle; 30" class I.
Langelier, 6" No. 1 bench
Leland Gifford, 14", No. 2 single or double spindle; 14" No. 2 motor spindle, power feed.
Sipp, 16" single or double spindle

DRILLS, MULTIPLE

12 spindle No. 11 Natco
8 and 12 spindle No. 12 Natco
12 spindle No. C12 Natco
18 spindle No. 13 Natco

GEAR MACHINERY

No. 16 HS Gould & Eberhardt hobbers
10", No. 1 Lees Bradner hobbers
26" Flather automatic spur
26" & 48" Brown & Sharpe automatic spur
36" Gould & Eberhardt automatic spur
60" Cincinnati automatic spur
No. Z1 Fellows gear shaper, large hole thru spindle.
8" Red Ring lapping machine
15" Gleason spiral bevel gear and spiral bevel pinion roughers
18" Gleason bevel gear testers, lappers and combined testers and lappers
Gleason spiral bevel cutter grinder.
Ingle 1½" to 12" chamferers
Lipe 2 spindle chamferers
No. 4 Peerless chamferers.

GRINDERS

12" x 36" Landis plain cylindrical
12" x 48" Cincinnati universal
16" x 36" Landis plain cylindrical
16" x 52" Landis cylindrical
No. 72 Heald electric indicator automatic internal
No. 50 Heald hydraulic cylinder
No. 60 Heald cylinder
No. 6 Landis cylinder
6" x 14" Wilmarth & Morman surface
16" x 50" Safety Emery wheel surface
20" Gardner semi-automatic disc
24" Gardner No. 84 opposed disc
1¾" Oliver No. 41 drill grinder
24" Cincinnati face milling cutter
Ingersoll tub milling cutter
2G Gould & Eberhardt gear cutter
Gisholt tool grinder
18" Whitney wet tool
36" Diamond wet tool
16" x 48" Landis crankshaft adjustable heads and throws.

LATHES

14" x 6' Rockford engine, QCG
18" x 8' Greaves Klusman engine, QCG
36" x 16' Putnam geared head engine, QCG
4" x 36" Lo Swing, hardened ways
8" Sundstrand stub
9" x 14" Porter Cable
1" x 18" Pratt & Whitney automatic
13" x 6' automatic threading
Melling 6 cyl. camshaft lathe

LATHES, TURRET

22" Libby geared head universal, 4⅛" hole.
26" Libby geared head universal 4½" hole.
26" Libby geared head universal 7½" hole.
28", No. 3 B Foster geared head universal, 5⅛" hole
21" Gisholt universal, 3½" hole.

MILLS, BORING

3", No. 3A Universal
3⅞" bar Beaman & Smith cylinder
42" Bullard vertical
52" Bickford vertical

MILLING MACHINES

No. 3 Van Norman duplex, vertical attachment
Size C Hall planetary thread
30" Newton continuous rotary
No. 1 Davis & Thompson continuous duplex
No. 3 Turnmilling machines
48" Oesterlein tilted offset
Types 10 & 45 Productomatic.

PLANERS

24" x 24" x 5' Gray
24" x 24" x 6' Woodward and Powell
36" x 36" x 16' Cleveland openside

PRESSES

28", No. 71 Swaine double crank
No. 174 Consolidated gap double crank, roll feed
No. PG5 Ferracute punching
No. 53 Toledo straight side
No. 8-7 Zeh & Hahnemann SS
150 ton Verdin Kappes & Verdin straight side forging or coining
No. 6 Waterbury Farrel gap frame
No. 38 Consolidated arch frame
No. 2 Standard screw press
No. 796¼ D Toledo double crank toggle drawing
3 ton Fox Superflex arbor
8 ton General Flexible No. 83 arbor

ROLLS

No. 1 Ajax forging
No. R 60 Yoder crown fender

SAWS, METAL

4", 7" & 8" Higley cold
5½", No. 15 Lea Simplex cold
36" Newton cold
No. 2 Grabo metal saw tables

SHAPERS

16" Milwaukee
26" Lynd Farquhar openside crank shaper planer
36" Morton draw cut

SHEARS

1½" Lewis alligator
8" x 8" x 1" Lewis double angle

TAPPERS

⅜", No. 1 Garvin
1" National 6 spindle nut
Natco 1 and 2 way multiple lead screw

UPSETTERS

4" Ajax twin geared with suspended header and die slides
4" Ajax original model, single geared

WELDERS

25 KW Winfield butt
65 KW Federal butt
12.8 KVA A.E.F. spot
15 KVA Taylor Winfield spot
20 KVA Taylor spot
20 KW Taylor Moesta spot
23 KVA Winfield spot
150 KVA A.E.F. special multiple spot
375 KVA Fisher Body press or projection
Automatic arc welder with GE head

MISCELLANEOUS

Balancer, Micropoise flywheel
Balancer, 44" Norton
Balancer, Sundstrand
Blowers, Size 2, 4½" B & 17 Roots
Coiler, No. 2 Sleeper & Hartley casing
Coiler, No. 5 Sleeper & Hartley spring
Chuck, magnetic, 12" x 24" Wright DeCoster
Die head, 4" Landis rotating
Doors, Rolling Steel 14' 6" wide
Honing machine, No. 211 Barnes
Hammer, No. 1 Pettingell bumping
Hoist, 1 ton Lo Hed electric
Hoist, 8 ton, Curtis air
Hoist, Lidgerwood friction drum
Keyseater, 1¼", No. 2 Mitts & Merrill
Lapper, No. 10U Norton
Mixer, Baker Perkins 2 blade
Motors, From 1/6 to 100 H.P.
Polisher, Acme automatic
Polisher, No. 575 Hawes for rods
Pipe Machine, 2" Rogaco
Press, Baird kick
Press, No. 0 Atlas arbor
Pump, Oilgear type WE5
Pump, 400 GPM Blackmer
Pump, 1000 GPM Fairbanks Morse fire
Reamer, Houde for heavy work
Rivet Heater, 15 KW General Electric
Riveter, Nos. 2A & 7B High Speed
Riveter, 20 ton Allen pneumatic
Scraper, Anderson electric
Screw Driver, No. 61AA Bodine
Screw Driver, Model C Detroit
Slotter, 4" stroke Garvin
Sprue Cutter, Tessmer, Model I
Stitcher, Saranac for cartons
Swager, No. 6 HS Langelier
Table, 20", 24" and 34" round indexing
Tester, 22 lb. Olsen drop tester
Tester, 60,000 lb. Olsen torsion
Tester, 230,000 inch lbs. Olsen torsion
Threader, ¾" Economy type R
Trolley, 3 ton Shepard electric
Washer, Blakeslee, conveyor type
Wire Straightener, ⅝" x 3' Shuster
Wiring Machine, No. RH Magee

MILES MACHINERY COMPANY

2025 EAST GENESEE AVENUE **SAGINAW, MICHIGAN**

PROMPT SHIPMENT
NO PRIORITIES REQUIRED

AUTOMATICS

4 spindle ¾" Cleveland Model M, m.d.
3¼" Cleveland Model A Automatic, m.d.
3½" Cleveland Model A Automatic, m.d.
3¼" Gridley single spindle, m.d.
3¾" Gridley single spindle, m.d.
4¼" Cleveland Model A, m.d.
6" Cleveland Model A, m.d.
6D Potter & Johnston, m.d.
No. 23 New Britain, belt
No. 23 New Britain, belt
No. 33 New Britain, m.d.

BOLT CUTTERS

No. 11 11-S Rickert-Shafer Automatic Threader, m.d.
¾" Economy Style B Automatic Threader, belt
1" Landis Double Spindle Bolt Threader, m.d.
American Bolt Heading Machine, belt

BORING MILLS

No. 0 Fosdick Horizontal, m.d.
No. 31 Lucas Horizontal, m.d.
3¼" bar No. 1 BE Bloomquist & Esk Hor. m.d.
4" double spindle Barrett Horizontal, m.d.
5½" bar Niles-Bement-Pond Horizontal, m.d.
W. L. Sargent Floor Type Horizontal, 2¾" bar, belt
34" Colburn Vertical, m.d.
42" Colburn Vertical, heavy duty, m.d.
42" King Vertical, 20 HP m.d., 2 rail heads, 1 side head
42" Niles - Bement - Pond Car Wheel Borer, belt
48" Cincinnati Rapid Prod. Vertical, m.d.
48" Niles - Bement - Pond Car Wheel Borer, belt
6' Cincinnati Vertical, m.d. late type
10' Betts Vertical, m.d.

BROACHES

NEW Cincinnati Mill Broach, m.d.
No. 2 LaPointe of Hudson Broach, belt
No. 3 J. N. LaPointe Double Broach, belt

BALL BEARING SENSITIVE DRILLS

¼" Automatic Sens. Mach. Co., m.d.
No. 5M—16" Fosdick, m.d. on spindle, tapping, No. 3 taper
Taylor & Fenn, No. 2 taper
1 spindle Allen, plug taper
Henry & Wright, Class K, No. 2 taper
2 spindle Sigourney, No. 1 taper
3 spindle Barr, No. 1 taper
4 spindle No. 2 Fosdick, power feed
4 spindle Gardam, No. 1 taper
4 spindle Kokomo, No. 3 taper
6 spindle No. 3 Avey, m.d.

MULTIPLE SPINDLE DRILLS

No. C-20-H Natco, 16 spindles
No. 2 Baush, m.d., 38x21" rect. head, hydraulic feed
No. 3 Baush, m.d., 16x30" rect. head, hydraulic feed
No. 2 Baush, m.d., 16x30" rect. head, mech. feed
No. 2 Baush, m.d., 16x30" head, tapping attach. mech. feed
No. 3 Baush, m.d., 20x40" head, mech. feed
No. 11 Pratt & Whitney, 14x9" rect. head, belt
No. 22 AC Fox, 16" round head, m.d.
No. 260 Fox Multiple Tapper, 44x28" head, 50 spindles
8 spindle 12" Rockford Gang Drill, m.d.
4 spindle Harrington H.D. No. 4 Taper

HORIZONTAL DRILLS

No. 008 Garvin Horizontal Duplex
Love Bros. Horizontal, No. 4 Taper
Pratt & Whitney Rifling Machine, belt
5 spindle Detroit Semi-Automatic
6 spindle National Acme Automatic
8 spindle Hammond, m.d. hydraulic

RADIAL DRILLS

3' American Hole Wizard, m.d. on arm, late type
3' American Triple Purpose, m.d. on arm, late type
6' Niles-Bement-Pond Semi-Universal, m.d.
5' Cincinnati Bickford Super-Service, 17" column dia. m.d. on arm
5' Prentice, plain, m.d.
5' Niles-Bement-Pond Full Universal, m.d. thru gear box on base
5' American Triple Geared, m.d. thru gear box
4' Niles-Bement-Pond Semi - Universal, m.d.
4' Hammond Jack Knife
4' Cincinnati Bickford Super - Service m.d. on arm, 13" col. dia.
4' Cincinnati Bickford Plain, semi-inc. head, oil grooved base, m.d.
4' American Triple Purpose Plain, m.d. fully inclosed head
3½' Cincinnati Bickford Plain, semi-inc. head, oil grooved base, m.d.
3' Western Plain, gear box
3' Cincinnati Bickford, Plain, m.d.
3' Fosdick Sensitive
3' American Sensitive
2' American Triple Geared
7' American Triple Purpose, m.d. on arm, late type

UPRIGHT DRILLS

20" Cincinnati, m.d.
22" Aurora, m.d.
22" Barnes All Geared-Self Oiling, m.d.
24" Cincinnati-Bickford Shaft Driven m.d. tapping att.
24" Cincinnati, belted m.d.
24" Hoefer, belt
25" Superior, belt
32" Superior, belt
36" Prentice, belt

GEAR CUTTERS & HOBBERS

Cross Gear Tooth Rounder, m.d. 24" cap.
No. 2—26" Cincinnati Gear Cutter
No. 3—26" Browne & Sharpe Spur Gear Cutter
No. 3—36" Browne & Sharpe Spur Gear Cutter
No. 3—Heavy Brown & Sharpe 24" Spur Gear Cutter
No. 4—36" and 4—48" Brown & Sharpe Spur Gear Cutters
No. 6—60" Brown & Sharpe Spur Gear Cutter
No. 6—72" Brown & Sharpe Spur Gear Cutter
12" Ingle Gear Tooth Rounder
16" Gould & Eberhardt Gear Cutter
18" Gleason Straight Tooth Bevel Gear Generator
30" Brainerd Automatic Gear Cutter for spur and spiral
48" Cleveland Gear Hobber for spur and spiral
90" Gould & Eberhardt Spur Gear Cutter
Gleason Spiral Bevel Gear Rougher

VALVE SEAT GRINDER

Cincinnati Mill. Mach. Co. Valve Seat Grinder, m.d. centerless type, cap. ⅜" valve stems

CYLINDER GRINDERS

No. 55, 60, 65 Heald

CYLINDER GRINDERS — PLAIN

6x32" Norton, m.d.
10x36" Landis Integral Cam, m.d.
10x48" Brown & Sharpe, m.d.
10x52" Landis, m.d.
10x72" Landis, m.d.
12x36" Cincinnati, belt
12x36" Modern, belt
12x36" Modern, m.d.
12x42" Landis, belt
12x48" Cincinnati, 3 motor drive, late type
12x48" Modern, m.d.
16x120" No. 18 Landis, m.d.
26x96" Landis, m.d.
20x120" Landis Plain Cylindrical, m.d., gap type

UNIVERSAL CYLINDRICAL GRINDERS

16x40" Landis No. 3, 3 motor drive

INTERNAL GRINDERS

No. 6 Bryant, belt
No. 10 Bryant, belt
No. 20 Bryant, belt
No. 72A5 Heald Hydraulic Internal, with extra attachment for grinding tapers in spindle, 3 motor drive

SURFACE GRINDERS

No. 1 Fraser Lapper, 26" plate
14" Pratt & Whitney Vertical Surface, m.d. cap. 12x36"
38"x38"x12' Gray Planer Type Surface, m.d.
54" Bridgeport Knife Grinder, belt

TOOL & CUTTER GRINDERS

Gisholt Universal Tool, belt
Gleason Cutter, belt
Gould & Eberhardt Gear Cutter, belt
Landis Chaser, belt

HAMMERS

400 lb. Bliss Board Drop, belt
600 lb. Niles-Bement-Pond, Steam
800 lb. Bement Single Frame Steam
1100 lb. Bement Miles Single Frame Steam

KEYSEATERS

No. 2 Baker, belt
No. 2 Morton, belt
No. 4 Mitts & Merrill, belt
1" Morton, belt
30" Stroke Morton, m.d.

ENGINE LATHES

14"x8' Sidney, cone
18" x 8' Reed-Prentice Geared Head, m.d.
18" x 10' McFarland & Nottingham, cone
20" x 8' Hendey Yoke Head
20"x10' LeBlond, cone
22"x16' centers (22' bed) American 100 H.P. Input Super Lathe, has power rapid traverse, chip breaker, chip conveyor, 100 H.P. D.C. motor, 6 smaller motors—latest type
22"x18' Niles, cone
24"x10' American Geared Head, m.d.
24"x10' Greaves-Klusman, cone, taper
25"x14' LeBlond, cone
27"x16' LeBlond, cone
30"x14' Lodge & Shipley Geared Head, m.d.
36"x10' Putnam, variable speed m.d.

MANUFACTURING TYPE MILLING MACHINES

54"x54"x10' Liberty Planer Type, m.d. with Cincinnati Head mounted on rail. Speed variations obtained thru D.C. motor.
Burr Mfg. Type 72x11" table
Becker Lincoln Type, cone
Carter & Hakes, cone
No. 10 Fox, cone
No. 2, 12 Pratt & Whitney Lincoln Type, cone
Newton Keyseat Miller, m.d.

PLANERS

24x24"x5' G. A. Gray, m.d. 1 head
24x24"x6' G. A. Gray, m.d. 1 head
24x24"x6' Pond, belt, 1 head
30x30"x10' American, 1 head, belt
30x30"x14' G. A. Gray, belt, 2 heads
36x36"x10' Cincinnati, m.d. 4 heads
36x36"x10' Niles, belt, 2 heads
36x36"x10' Ohio, belt, 1 head
36x36"x12' Powell, m.d. 2 heads
36x36"x20' Cincinnati, belt, 2 heads
42x42"x26' G. A. Gray, m.d. 2 heads
48x48"x40' Sellers, reversing m.d. 3 heads
56x48"x18' Putnam H.D. reversing m.d. 4 heads
60x60"x20' Cincinnati, m.d. 4 heads, p.r.t.
60x60"x20' G. A. Gray, m.d., 4 heads, p.r.t. box table
96x72"x18' Pond, m.d., 4 heads

PRESSES

No. 2 Langelier, ¾" stroke
D2 Ferracute O.B.I. Single Action Drawing, 2" stroke
No. 6 Waterbury-Farrel D.C. 1½" stroke
S51 Ferracute D.C. 2" stroke, 50 tons ram pressure
No. 54A Special Toledo, m.d. 2" stroke for armature notching
B45 Metalwood Hydro-Pneumatic
B33 Metalwood Hydro-Pneumatic
30 ton Lourie Hydraulic Type BX
No. 268¼R Toledo D.C. Toggle Drawing, m.d. double geared, has 41" shut height, 15" stroke on blankholder, 29" stroke of plunger, weight 175,000 lbs.
No. 496D Toledo D.C. Toggle drawing, m.d. bolster 95x50", stroke of blankholder 11½", stroke of plunger 17", weight 160,000 lbs.
300 ton Niles Horizontal Wheel Press, m.d.
No. 0 Springfield Bench Type Straightening Press

SAWS

8x8" Atkins Power Hack Saw
Klemm Tilting Metal Cutting Band Saw 6x6"
6" Avey Milband Cutting-Off Machine
No. 2B, 5, 6 Cochran-Bly Cold Saws
No. 3, 8 Nutter & Barnes Cold Saws
No. 11½ Higley Cold Saw
No. 15 Lea-Simplex Cold Saw
20" Burke Cold Saw
Knowlton Cold Saw
5" Newton Cold Saw
No. 138 Espen-Lucas Cold Saw, m.d.
Burr Cold Saw

TURRET LATHES AND SCREW MACHINES

No. 2 Pratt & Whitney Shaver, m.d.
No. 2L Gisholt, m.d., hardened ways, extended bed, chucking equipment, Timken Bearings, late type
No. 3 Cincinnati Acme Full Universal, m.d. chucking equip.
No. 3A Warner & Swasey Universal, m.d., chucking equipment (3)
No. 3A Warner & Swasey Universal, m.d., bar equipment
2⅛x24" Jones & Lamson, bar equipment, steel head type, m.d.
3x36" Jones & Lamson Geared Head, bar equip. m.d.
3x36" Jones & Lamson Geared Head, chucking equip. m.d.
2 spindle 3x36" Jones & Lamson Geared Head, chucking, m.d.
18" Libby Type A Geared Head, chucking
20"x7' American Turret Lathe, cone
24" Gisholt Turret Lathe, cone
28" Gisholt Turret Lathe, cone
No. 3 Gisholt Turret Lathe, m.d., bar equipment

SHAPERS

22" Niles Traveling Head, belt

Partial listing only. Let us quote. Every machine listed is in stock.

The EASTERN MACHINERY Company

1002 TENNESSEE AVE. CINCINNATI, OHIO

"NATIONAL"

CAN MEET *YOUR NEEDS*....from one of the most COMPLETE STOCKS *ever offered the metal working industry at a time like this*...

for example:

LATHES

DAVIES 12" x 6' quick change, M.D.
SEBASTIAN 12" x 8' quick change, Gd. Head, M.D.
MONARCH 14" x 6' quick change, M.D.
NATIONAL 16" x 6' quick change, M.D.
ROCKFORD 16" x 6' Screw Cutting Lathe, M.D.
DAVIES 18" x 8' Screw Cutting Lathe, M.D.
AMERICAN 18" x 6' quick change, M.D.
GREAVES and KLAUSMAN 18" x 8' Lathe, M.D.
REED 20" x 10' Lathe with Taper Attachment, M.D.
SCHUMACHER and BOYE 20" x 12' Engine Lathe, M.D.
DRAPER 27" x 16' Bed Geared Face Plate Drive, M.D.
NATIONAL 40" x 18' Bed Geared Face Plate, M.D.

TURRET LATHES

WARNER and SWASEY 1" and 1½" Turrets, M.D.
PRATT and WHITNEY 1" and 1¼" Turrets, M.D.
JONES and LAMSON 2¼" x 24", 3" x 36" Turrets M.D.
REED-PRENTICE 2" Geared Head Power Feed to Turret

MILLERS

BROWN and SHARPE Hand Millers, 00., M.D.
VAN NORMAN No. 0, No. ½ Millers, M.D.
GARVIN No. 2 Universal with Divid. Hds. Vert. Attach., M.D.
OWEN No. 3 Univ. Miller with Divid. Heads, Vert. Attachment, M.D.
MILWAUKEE No. 1A Millers, Double Overarm, M.D.
KEMPSMITH No. 32, No. 33 Millers, M.D.
PRATT and WHITNEY No. 3 Plain 9" x 48" Table, M.D.
CINCINNATI No. 2 Vert. Miller, S.P.D.
BECKER No. 5B Vertical Millers, M.D.
INGERSOLL HEAVY DUTY MILLER 14" x 48" Table, M.D.
ROWBOTTOM Automatic Cam Miller, M.D., for making all types Cams.
INGERSOLL PLANER TYPE MILLER, 30" x 10' Table, M.D.

AUTOMATIC SCREW MACHINES

BROWN and SHARPE No. 0 AUTOMATICS
NEW BRITAIN ⅜", 1", and 1⅝" Six Spindle Automatics, M.D.
NATIONAL ACME No. 82 Four Spindle Automatic Screw Machines, M.D. (6)
NATIONAL ACME 2¼" Capacity Four Spindle Automatic Screw Machines, M.D.
CLEVELAND MODEL A ⅝" Cap. Screw Machine

SHAPERS and SLOTTERS

GOULD & EBERHARDT 14", 20" and 24" Shapers, M.D.
STEPTOE 18" Shapers, M.D.
KELLY 24" Shaper
HENDEY 18" Shaper
BETTS 14" Vertical Slotter

PLANERS

PRATT & WHITNEY 24" x 24" x 5' Planer
POWELL 36" x 36" x 8' Planer
PLANERS (continued)
SELLERS 36" x 36" x 9', 4 Heads
GRAY 36" x 36" x 10' with 3 Heads, M.D.
DIETRICK & HARVEY PLANER 48" x 36" x 18' Open-side, M.D.

BORING MILLS

SINSSE 2½" Bar Horizontal Boring Mill, M.D.
GIDDINGS and LEWIS 3" Bar Horiz. Boring Mill, Table Type, M.D.
BULLARD 24" New Era Vert. Boring Mill
BULLARD 30" Vert. Boring Mill with Hex. Turret
BICKFORD 50" Vert. Boring Mill with 2 Vert. Heads on Cross Rail, M.D.
COLBURN 48" Vert. Boring Mill with 2 Vert. Heads on Cross Rail

GRINDERS

BULLARD 24" Vertical Rotary Surface
BROWN & SHARPE No. 2 Surface Grinders
BROWN & SHARPE No. 3 Planer Type Surface Grinder with 30" Magnetic Chuck
BROWN & SHARPE No. 13 Univ. Tool & Cutter Grinder
PRATT & WHITNEY 14" x 36" Vert. Surface Grinder, B.B.
LANDIS 20" x 96" Universal Cylindrical Grinder
CENTERLESS GRINDER similar to CINCINNATI No. 3

DRILLS

BARNES 20" Camel Back Drill Presses
SNYDER 24", 36" Sliding Head Drill Presses
FOSDICK 3½" Radial Drill, M.D.
DRESES-MUELLER 4' Radial Drill, M.D.
CINCINNATI-BICKFORD 6' Radial Drill, M.D.
WELLS Multiple Spindle Gang Drill.
PRATT & WHITNEY No. 11 Multiple Spindle Drill
BAUSCH 12 Spindle Multiple Drill with Cap. to Drill 12-1½" Holes.
DETROIT 5 Spindle Drills

PRESSES

ADRIANCE No. 14S Double Action Power Press similar to Bliss No. 3½B Toggle (Brand New)
ADRIANCE No. 406 Geared Arch Press
ADRIANCE Double Crank Perforating Presses with Auto. Roll Feeds for Expanded Metal, etc.
ADRIANCE 100 Ton Straight Side Press, Tiered Construct.
BLISS Nos. 18, 19, 19C, 19½, 20, 21, 21B O.B.I.
BLISS No. 152B Double Crank Power Press
BLISS No. 138 Double Crank Geared Power Press, Bed 70" x 20"
BLISS Nos. 1, 2 and 4B Double Crank Presses
BLISS Nos. 1, 1½, 3½ Toggle Drawing Presses
BLISS Nos. 16 and 39 Horning Presses
BLISS No. 703 FLAT EDGE TRIMMER, DIRECT MOTOR DRIVEN
BLISS No. 3 Knuckle Joint Press, Geared M.D.
BLISS Nos. 1, 2, 3 and 4 Stiles Type Power Presses
BLAKE & JOHNSON 75 Ton Knuckle Joint Power Presses with Transfer Attach.
CONSOLIDATED 72" x 36" Double Crank Power Press, Twin Drive, Power Adj. to Ram
CONSOLIDATED No. 23, and No. 84 Horn Presses
CONSOLIDATED 36" Wide Ram Double Crank Horn Press
PRESSES (continued)
NIAGARA No. 26 Arch Press
SWISS 200 Ton Straight Side Single Crank Power Presses
WATERBURY FARREL Eyelet Presses
WATERBURY FARREL Dial Feed Cartridge Shell Presses
WATERBURY FARREL Horiz. Rack and Pinion Shell Reducing Presses
BAIRD No. 3 Tandem Press with Roll Feed

SHEET METAL MACHINERY

YODER 20 HEAD ROLL FORMING MACHINE SUITABLE FOR AIRCRAFT WORK, M.D.
ROLL FORMERS—All Sizes
ADRIANCE 30" Gang Slitters
YODER 24" Gang Slitter for Coil Metal, M.D.
YODER G36 Gang Slitters, M.D.
WATERBURY FARREL 48" Mill Type Coil Slitter
TOLEDO 52" Gang Slitter
LAMB & NASH 72" Gang Slitter
PEXTO 10' Power Shear, M.D.
VERSON 54" Press Brake, M.D.
VERDES, KAPPES & VERBES Press Brake with Auto. Roll Feed, M.D.
OHL 10' x 10 Ga. Power Press Brake
DREIS & KRUMP 10' x 10 Ga. Power Box and Pan Brake
PELS No. 13 Allsteel Combination Punch and Shear, with Coper, M.D.
PELS Heavy Duty Beam and Channel Shear, will shear up to 12" I Beam at one stroke
PELS Allsteel Angle Shear, cap. to 8" x 8" x ⅝" Angles
WELDERS—Spot, Butt and Seam in ALL SIZES
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SLEEPER & HARTLEY Nos. 0, 2, 3 and 4 Universal Spring Coilers
SLEEPER & HARTLEY No. 4 Spring Looper
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WELLS Bed Spring Making Machinery
WATERBURY FARREL and MANVILLE—Cold Rivet Headers and Thread Rollers
WATERBURY FARREL Wire Drawing Machines—All Sizes
NATIONAL Bent Nut Tappers, and Wire Nail Machines
BARBED WIRE Making Machine
TORRINGTON and LANGELIER Wire and Tube Swagers
BRODEN 5" x 8" Rolling Mills, Water-Cooled, M.D.
STANDARD 8" x 10" Rolling Mill

MISCELLANEOUS

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LaPOINTE No. 3 Broaching Machine
BROWN & SHARPE Gear Cutter
HIGH SPEED HAMMER CO. Nos. 1½B, 3A, 4A, and 5A Riveting Machines, M.D.
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Machine tool stock, still includes some of those HARD TO FIND ITEMS. Check these over and the price may surprise you.

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18" x 16' Schumacher, Boye & Emmes Lathe, 3 S.C.D. D.B.G.
24" x 12' Niles Heavy Duty Lathe, Cone drive, Q.C.
24" x 14' Putnam Heavy Lathe, 3 S.C.D.
36" x 30' LeBlond Heavy Duty Grd. Hd. Q.C. M.D.

MILLING MACHINES

#3GH LeBlond H.D. Plain, Power Rapid Traverse.
#4 Cincinnati High Power Vertical, M.D. (late type)

PLANERS

24" x 24" x 8' G. A. Gray Planer.
26" x 26" x 8' Woodward & Powell Planer A.C.M.D.
30" x 30" x 10' Cincinnati Box Table, A.C.M.D.
42" x 42" x 20' CINCINNATI LATE TYPE BOX TABLE, D.C. VARIABLE SPEED MOTORS 4 Hds.
72" x 60" x 28' Pond Heavy Duty Planer, Belt drive.

GEAR MACHINERY

6" Bilgram Bevel Gear Generator.
18" Gleason Straight Tooth Bevel Gear Generator.
#3-26" Brown & Sharpe Automatic Gear Cutter.
#4-36" Brown & Sharpe Automatic Gear Cutter.
Lees Bradner Helical Gear Grinder.

RADIAL DRILLS

2½' American Radial Drill, A.C. M.D. Swing table.
3' American Sensitive Radial Drill, Belt drive.
3' Cincinnati Bickford Plain Radial Drill S.P.D.
4' CARLTON HEAVY DUTY PLAIN RADIAL 13" column, FULLY ENCLOSED HEAD, BOX TABLE A.C. M.D.
5' CINCINNATI BICKFORD RADIAL DRILL D.C. VARIABLE SPEED MOTOR ON ARM EXTRA HEIGHT COLUMN 84" UNDER RAIL.

GRINDERS

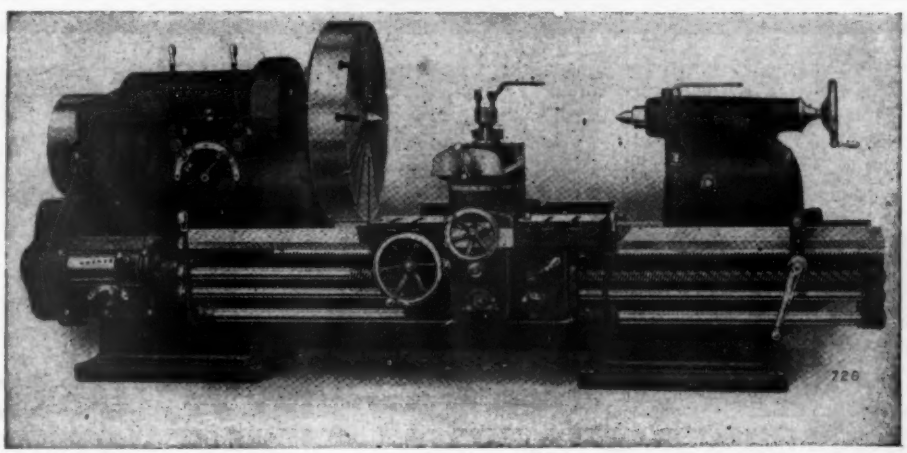
#16 Brown & Sharpe Plain Grinder 10" x 72".
Fitchburg Spline Grinder

MISCELLANEOUS

6" x 120" Pratt & Whitney Thread Miller.
#2 LaPointe Broaching Machine, M.D. A.C.
#0 Baker Keyseating Machine, M.D. A.C.
#1 Klemm Metal Cutting Band Saw.
Atkins Metal Cutting Saw.
1500 Lb. Bell Steam Hammer.
14" Niles Slotter.
#1 Gray Sheet Metal Nibbler.
2" Landis Pipe Threading Machine.

36" x 30' LEBLOND HEAVY DUTY GEARED HEAD A.C. M.D.

24' CENTER DISTANCE



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N.B.P. 96"x69"x15' Planer; 4 heads; box table; variable speed M.D.
GRAY 60"x60"x14' Planer; 3 heads
N.B.P. 48"x36"x14' Planer; 3 heads
GRAY 24"x24"x6' Planer; 1 head
CINCINNATI No. 3 Vertical Miller; dial feed; Timken bearing
K. & T. No. 2B & No. 3B Plain Millers
CINCINNATI BICKFORD 4' x 6' Pl. Radial Drills

HENDEY 18" x 8' & 20" x 8' Engine Lathes
BRADFORD 42" x 16' Engine Lathe

CRANES—from 5 to 20 ton capacity
TOOLROOM EQUIPMENT—such as Drills, Reamers, Milling Cutters, etc.
RAW MATERIALS—Steel, Lumber and many other items

BLANCHARD No. 16A Rotary Surface Grinder; M.D.
NORTON 15"x15"x72" Surface Grinder; M.D.
NORTON 14" x 72" Plain Grinder
CINCINNATI No. 1½ Universal Grinder
LUCAS No. 31 Horiz. Boring Mill; M.D.
LUCAS No. 1, 3" bar Horiz. Boring Mill; M.D.
LUCAS No. 3, 3½" bar Horiz. Boring Mill; M.D.

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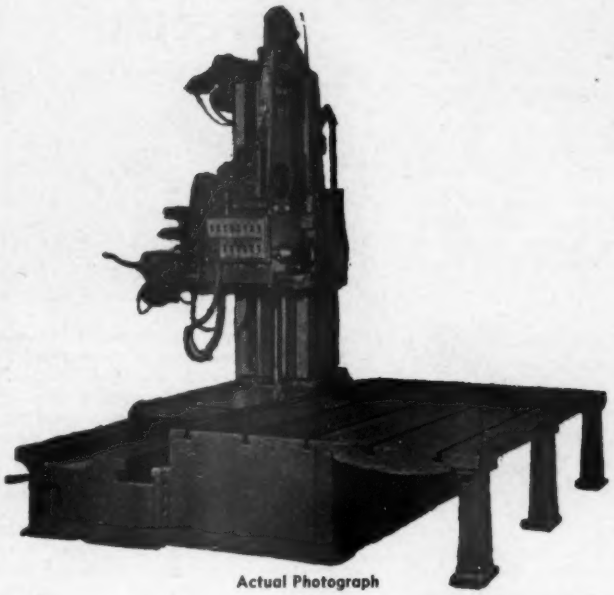
for Die Sinking, Milling and Profiling



Actual Photograph

Die capacity—face 88" x 48"
depth with standard table 30"
depth with extension table 58"
Head vertical travel 48"; horizontal travel 72"
Spindle head travel 18"
Maximum reach of spindle 24"
Center distance between cutter and spindle tracer max. 50½"; min. 35½".
Working surface standard table 88" x 30"
Working surface extension table 88" x 58"
Equipped with panel board and switch boxes
Vertical feed drive motor—¾ HP. 110 volts, vary RPM. Ohio D.C.
Cutter spindle motor—2 HP. 115 votls, Gen. Elec. D.C. motor
Column drive motor—⅝ HP. intermittent duty. 115 volts, G.E. D.C.
Horizontal traverse motor—⅛ HP. 115 volts. Ohio D.C.
Weight approx. 16,500#

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2—Deane Steam Pump Company Triplex Vertical Hydraulic Pumps, 6" x 8", 200 GPM, 200 lbs. W.P., Arranged for Geared Motor Drive.

1—Boomer and Boschert Triplex Vertical Hydraulic Pump, ⅞" x 4", 3 GPM, 4000 lbs. W.P., Flat or V-Belt Drive.

3—New Single Opening Hydraulic Presses, 50 Tons Capacity, 12" x 12" Platens. Any Desired Daylight Opening, 8" Diameter x 8" Stroke Rams.

6—Used Single Opening Hydraulic Presses, 12" x 13" Steam Platens, 60 Tons Capacity, 6" Daylight Opening, 10" Diameter x 6" Stroke Rams.

1—Southwark 2-Opening Hydraulic Press, 150 Tons Capacity, 24" x 24" Steel Steam Platens, 4" Daylight per Opening, 12" Diameter x 12" Stroke Ram.

1—8 Opening Hydraulic Press, 30" x 52" 2" Steel Platens, 3" Openings, 2-14" Diameter x 23" Stroke Outside Packed Rams, 2500# WP, Complete with 4 Plunger Vertical Hydraulic Pump with 15 HP A.C. Motor, and All Other Operating Accessories.

1—Watson-Stillman Hydro-pneumatic Accumulator, 25" x 7" x 48", Capacity 8 Gallons per Stroke, 2550 lbs. Hydraulic W.P., Complete with 36" x 20' Steel Air Tank, Southwark By-pass Valve, and interconnecting Piping and Fittings. Presently Connected to:

1—Southwark Triplex Vertical Hydraulic Pump, 1½" x 6", 11.5 GPM, 2500 lbs. W.P., Complete with Westinghouse 15 HP, Slip Ring Motor, 3/60/220, with Push Button Starter.

OTHER SPECIALS

1—Bliss #20 OBI Power Press, 2½" stroke, Flywheel Type.

1—Styles and Fladd OBI Power Press, 2" Stroke, Flywheel Type, Equivalent to and Practically Identical with Bliss #20.

1—Charles Ross 3-roll Water-Cooled Mill, size 12" x 30", Arranged for Belt Drive.

All Offered Reconditioned and Guaranteed. Prompt shipment. Drawings and Other Data on Request.

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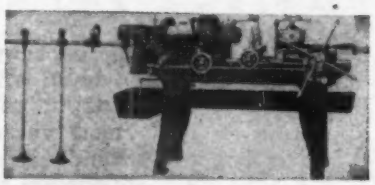
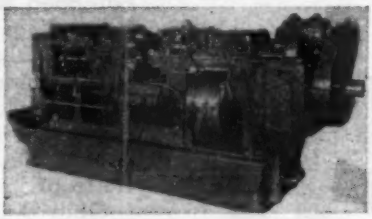
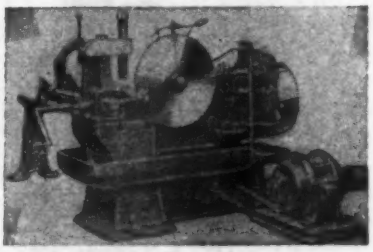


No. 5 Foster automatic chuck and bar feed as featured, with stock stands, back gear, power feed to the turret, six stage, cone drive, 1-13/16 stock capacity. Selling at a reduced price.



1¼" New Britain 4 spindle automatic chucking machine without motor. Price $1450, for immediate consideration. Call, write, or wire.

SPECIAL



No. 5 Cochrane-Bly as featured without motor. This machine is guaranteed to be in very good condition. Special price $650. Cost of equal new machine over $1600. If you can use a good cut-off saw, write, call, or wire for your option.

No. 21 Gisholt 2" hole thru spindle power feed all directions, 3-step cone drive with countershaft. Equipped with several turret tools and 3-jaw chuck. Selling it at reduced price.

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ACME, Model C, 9/16" M.D. (11)
CLEVELAND, Model A—1¼, 2, 2¾ & 3¾" M.D.
CLEVELAND, Model B—⅞, 1½, 2 & 2½" M.D.
CLEVELAND, Model M—1½" 4 Spdle. M.D.
GRIDLEY, Model G—9/16" M.D. (10)
GRIDLEY, Model G—⅞" M.D. (8)
GRIDLEY single spdle.—2¼, 4¼ & 5¼" M.D.
NEW BRITAIN #22 Chucker, M.D.
POTTER & JOHNSTON #5A & 6A M.D.

Miscellaneous

Gear Hobbers, #5A LEES-BRADNER
Gear Shapers, FELLOWS, #6 & #7 High Speed, M.D.
Grinder, BLANCHARD #16A R.S. 30"x18" Magnetic Chuck, M.D.
Lathes, FIFIELD, 32"x14', L.C.G.
Lathe, STEINLE Turret, 24"x4½" & 6¼", M.D.
Lathes, WARNER & SWASEY, #2A & 3A Universal, M.D.
60"x17' PUTNAM Lathe with 12" Riser Blocks, total swing 85", M.D.
Milling Machine, BECKER Vertical, Model S. D. 40" Rotary Table, Belt Drive
Milling Machine, MILWAUKEE #3B Plain, M.D.
Pipe Machine, SAUNDERS, 2½ to 8", M.D.

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Belt Cutter 1" capacity, 3 spindle
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Drill, new 10" Buffalo bench
Drill, ceiling suspended, unlimited drilling area
Drill Press, 20" three spindle Barnes
Drill, six-spindle Henry & Wright, 12" overhang
Drill, two spindle sensitive, #1 Morse taper
Grinder, #20 Bryant deep hole internal
Grinder, 60" plate
Grinder, Sellers Tool
Hammer, 50# Bradley helve
Lathe, 14"x12' Lodge-Shipley grd. hd. s.c. mtr. dr.
Lathe, 24" x 18' Bieptoe-McFarlan
Pipe Machine, 6" Merrell
Press #8-7 Zah-Hahnemann straight side grd.
Press, #1 open back inclinable, motor drive.
Punch & Shear, two ½" capacity
Threading Machine, #0 Webster & Parks
Turret Lathe, L & D brass, cross slide turret
Vacuum Cleaners, heavy duty for shop use

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48" x 36" x 16' Gray Dbl. Housing Planer, 3 hds., 15 HP, A.C. m.d.
28" x 28" x 6' Gray Planer, 1 hd. on rail, m.d. with 5 HP, A.C. motor
3" bar Morris Horiz. Boring Mill with 4 boring bars, m.d.
3' Carlton Sensitive Radial Drill, 3 M.T. hole
6' Niles Plain Radial Drill, gear box m.d., 15 HP motor, rebuilt
12" x 18" Cinci. Plunge Cut Grinder, m.d., accommodates wheels up to 9" face, rebuilt.
Gisholt Tool Grinder, arranged for m.d.

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54", 62" Colburn, 2 hds, M.D.
60", 10' Niles, 2 hds.
2 — 36" Bullard, V.T.L.

HORIZ. BORING MILLS

2½" Universal, Binsee, M.D.
4" Gisholt, Binsee, M.D.
4½" Bement-Niles

GRINDERS

50"x28' Norton, M.D.
12x28", 12x48", Modern, M.D.
16x50" Norton Crank Shaft
20"x72" Landis
14", 18" P. & W. Vert., M.D.
12x52" Landis Self-Contained

LATHES

24"x26' Putnam
30"x20' LeBlond
24"-48"-60"x12'-16' Harrington Sid. Bed
24"-42"x14' McCabe 2 spindle
28"x14' raised to 34" Rahn-Larmon, M.D.
16"x22' Fay-Scott
24"x10', 12' Boye & Emmes, Taper

MILLERS

No. 2, 3, 4, 5 Cincinnati Plain Grd. Hd., H.P., M.D.
No. 3, 4, Cincinnati Vert., H.P., M.D.
No. 2, 3, 4, Cincinnati Universal
Bliss Planer Type Vert.

RADIALS

4' American Tpl. Purpose, M.D.
3' Cincinnati-Bickford, M.D.
5' Dreses-Mueller
4' Mueller, M.D.

TURRET LATHES

26" Libby, 8" hole, M.D.
24" Gisholt, 6¼" hole
21", 28" Gisholt, 3½" hole
W. & S. No. 2, 4, 6, 2A, 3A, M.D.
B. & S. #00, 0, 2G Automatics
Cleveland Model A Automatics, ⅜" — 2½"
#6A P. & J., M.D.
18" Libbey

MISCELLANEOUS

6", 10" P. & W. Slotters, M.D.
McCabe ½" Flangers
Pels 6' Throat Punch, 1"x1¼"
72" Gardner Grinder, M.D., 1 yr. old
10' Hanchett Face Grinder

AARON MACHINERY CO.

45 CROSBY STREET **NEW YORK, N. Y.**

72" x 48" x 24' Gray Planer—two hds. on rail reversing motor drive

3" bar Universal Horizontal Boring Machine

36" x 36" x 8' Cincinnati Planer—one head — arranged constant speed motor drive

18" Libby Turret Lathe—4¼" hole

4-spindle Henry & Wright Ball Bearing Drills (11)

18" x 120" Type A Norton Grinder completely motorized

24" x 36" x 10' Ingersoll Horizontal Spindle Slab Milling Machine

24" x 24" x 14' Ingersoll Adjustable Rail Miller one vertical head

32" x 37½" x 12' Ingersoll Adjustable Rail Miller two vertical heads

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BORING MILL, 38" Gisholt, 1 head, S.P.D.
DRILL, Heavy Samson Arch Frame, No. 5 M.T.
GEAR PLANER, Bevel 54" Gleason, M.D.
GRINDER, Cylindrical 12" x 72" Cincinnati
HAMMER, Steam Forging 1100 lb. N-B-P
MILLER, Plain High Power 3-B Cincinnati
MILLER, Universal Geared Head 1-B Milwaukee
MILLER, Vertical Plain 5-C Becker
PLANERS, 48" x 48" x 12' Gray, 4 heads, M.D.
PRESS, 95-B Toledo, bed 55" x 54", stroke 3"
PRESS, Hydraulic 1000 ton Wood, platen 42" x 9', stroke 18", daylight 36", accumulator, etc.
PUNCH, No. 4 Chamb, throat 36", 1¼"-1"
TURRET LATHE, 3-A W & S, H.S. 3-11/16"
TURRET LATHE, 26" Libby "C", H.S. 7⅝"
TURRET LATHE, 34" Gisholt, H.S. 4⅛"
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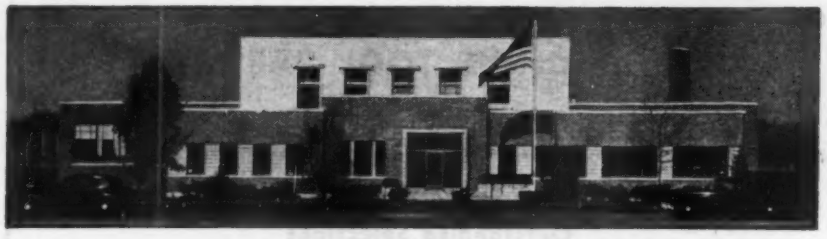

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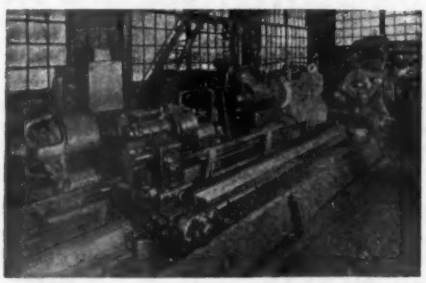

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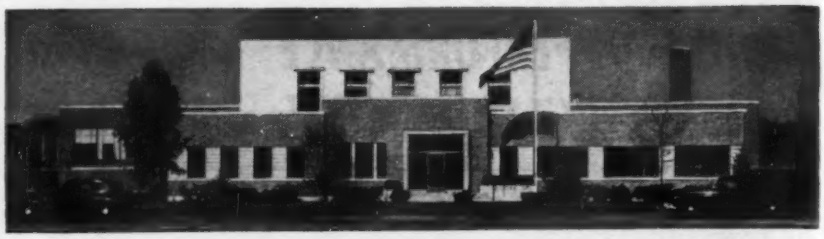

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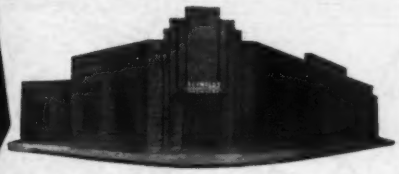

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13" x 8' Automatic Threading Lathe.
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17" x 8' Sidney.
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24" Potter & Johnston.
24" Cincinnati.

RADIAL DRILLS
3' American, Gear Box.
5' Cincinnati Bickford, Motor Drive.

PIPE MACHINES
4" Landis, Motor Drive.
6" Landis, Motor Drive.

MILLERS
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#1½ Knight Vertical.
#12 B. & S. Production.
#3 Kempsmith.

MISCELLANEOUS
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148 N. 3rd STREET PHILADELPHIA 6, PA.

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$16,000 Cost
For SALE at Big Discount
Pratt & Whitney Taft Pierce
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Snap, threading, expansion plug, plug thread, Go & No Go.
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American 24 x 22' geared head quick change AC motor driven lathe 90% new.
Johnson 50" x 30', 22' centre, triple geared heavy duty engine gun boring lathe.
Cleveland heavy duty punch and shear 40" throat.
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Pond 49 x 40 x 9' heavy duty planer, 2 swivel heads on rail, belt drive.

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NEW ENGLAND HEADQUARTERS] FOR [MODERN MACHINE TOOLS

The Supreme Machines of Industry

GENERAL MACHINERY CORPORATION
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This
NEWSPAPER
advertisement was published in Washington, New York and Chicago by McGraw-Hill, to make friends for business.
COURT

DEMOCRATS *need "Seed Money," too*

Seed Ideas and Seed Money

Whether you run a whole business, a plant or a section, the very fact that you hold this magazine in your hands indicates that you are interested in *improvement*.

Did you ever stop to think that that instinctive desire to find a better way of doing things is the fundamental driving force of America?

It is.

If allowed to function in an environment economically and politically favorable to industry, this American instinct for improvement can carry us forward to undreamed standards of living and of culture.

The only barrier to constant improvement is lack of public understanding.

Industry cannot have a favorable environment, however, until industry itself clearly defines its objectives, and explains them clearly to every citizen *in terms of social progress*.

This Seed Money advertisement (reprinted from the McGraw-Hill newspaper campaign now running in Washington, New York and Chicago) is intended as a starter in a nation-wide process of education on the source of good living.

Some companies are running the Seed Money Advertisements locally, over their own signatures. Others are starting their own campaigns. Either way, the Seed Idea is being planted.

If you would like to reproduce this message in your plant city, free mats and booklet reprints (sold at cost) are available.

James H. McGraw, Jr.
President

McGraw-Hill Publishing Company, Inc.

NOW don't get excited, folks, this isn't a political advertisement. We've got some thoughts on our mind about how to make big problems simple, and we are using the word "democrat" the way the men who thought it up used it.

More than 2,000 years ago, the Greeks decided to quit believing in Superman, and they invented this word to express their general idea.

► Every schoolboy knows how that idea was pulled off the shelf sometime back, and a form of government hammered out that would allow Joe Doakes enough personal elbow room to do his stuff in the world.

Every schoolboy knows, too, that what followed—particularly in America—was the most rapid development ever known.

Within the memory of living men, we have traded the economy of the hoe for the tractor, the muscle for the motor, the eye for the electronic tube.

So vast has our mechanical might become that by shifting the ends of our production lines from the garage, the kitchen and the living room to the skies above Italy, Germany and Japan, we are changing the history of the whole world.

With all this glory to his credit, wouldn't you think the common man would know how he did it,

[FREE MATS: If you would like to publish this message over your own company name, or distribute it in handy booklet form, write or wire: Research Dept., McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York (18), N.Y.]

DEMOCRATS *need "Seed Money," too* (cont'd)

and how to keep on the road to better living after the war?

He doesn't know, because he discounts the part that his own, native love for *improvement* plays in our national life.

This love for *improvement* started on pioneer farms. It continued in millions of garages and kitchens. It rides with every American gunner today.

American *improvement* is essentially a Joe Doakes affair. Here's how it works:

1. Joe invents something and invests Seed Money in equipment and materials to make it.
2. People buy it.
3. That makes good paying jobs.
4. Joe invests more Seed Money to improve his product or his method of making it.
5. More people buy it.
6. That makes more good paying jobs.
7. Joe invests more Seed Money in more and better machines, to get volume production.
8. So, Joe lowers his price.
9. Still more people buy.
10. That makes more good paying jobs.

Try to figure out any other foundation for American wealth, leisure, culture, fighting strength or material possessions!

► This simple progression, multiplied by millions of instances, explains why "Seed Money" is so important in our national life.

Seed Money is used every time a product or a machine is improved, because Seed Money means "that part of profit which is 'plowed back' into a business."

Joe Doakes will need his Seed Money, to attract customers and create jobs when this war is over. But a dangerous percentage of Joe's Seed Money is being blotted up in the Excess Profits Tax.

Perhaps our government intends to return some of this money after the war, as a loan. But this would mean another government bureau, more Federal employees, all of which will further increase the cost of government. But above all—Business will not be free to "take a chance" with this money. It belongs to the government. Hence, the "take a chance" spirit, the life breath of progress, will be hobbled just when Americans need it most.

► There is a simple and much more effective way to supply our American industry and commerce with Seed Money.

Change our tax laws to permit industry and business to set aside from present earnings the tax-free Seed Money that they will need to reinvest in improvement of plant, products or essential operations to create jobs after the war.

To put this simple, effective procedure into practice, our government must change its attitude toward the source of all improvement—Seed Money. To bring this about, remind your Congressman that:

"Industrial Progress
is the Source of all Good Living."

THE McGRAW-HILL NETWORK OF INDUSTRIAL COMMUNICATION

24 publications, which gather "war-news" from the "war-production-front" through a staff of more than 153 editors and 725 engineer-correspondents . . . More than 1,500,000 executives, designers, production men and distributors use the editorial and advertising pages of these magazines to exchange ideas on war-production problems.

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This advertisement is available in handy booklet form. (Less than 100 copies free. Larger quantities, $1.00 per 100; $10.00 per 1000.)

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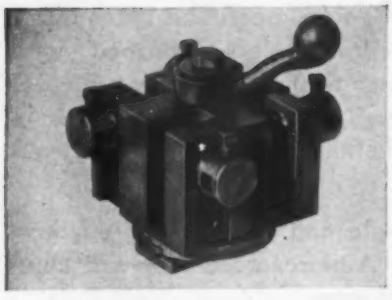
Business Publishers International Corporation, an affiliate, publishers of Business and Technical Magazines for Latin America, and Overseas Circulation

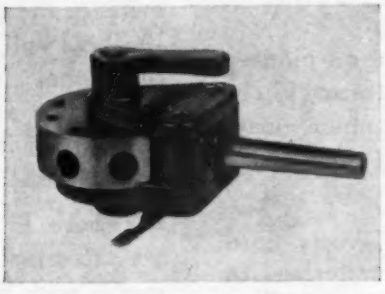
How to do turret lathe machining ... on your engine lathe!

THESE 3 SPECIALTIES LATHE ACCESSORIES MAKE IT POSSIBLE



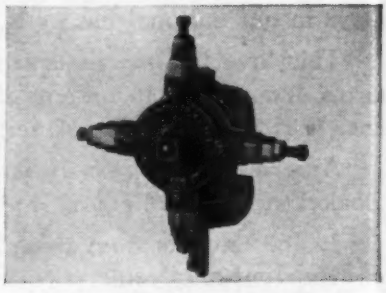
SPECIALTIES CROSS-SLIDE TURRET

Enables you to do multiple machining operations on the same lathe. Easy to operate, merely flip turret clockwise or counter-clockwise, from one index position to another.



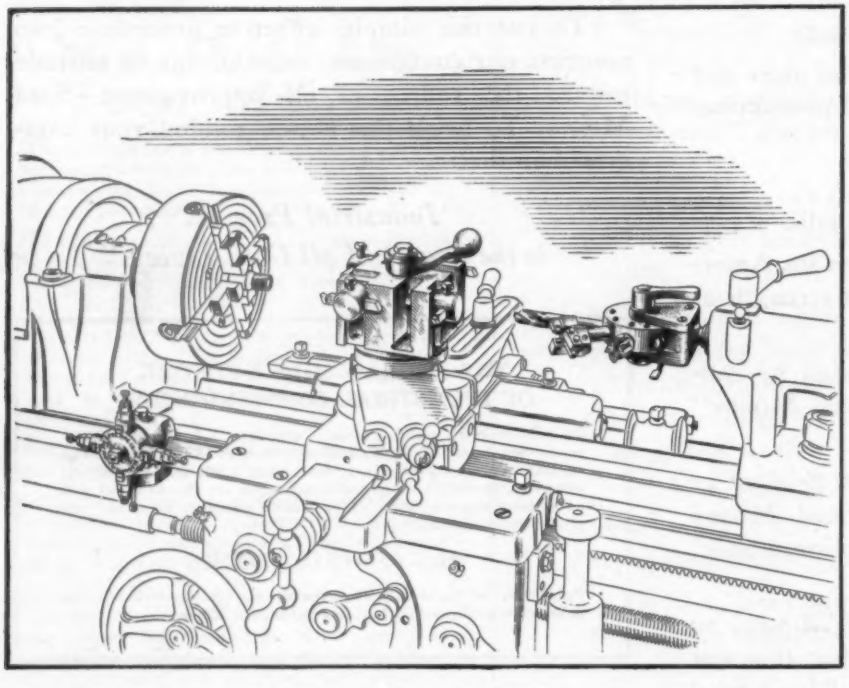
SPECIALTIES TAIL-STOCK TURRET

Quickly converts engine lathes into 4-way turret lathes for end work. You perform four different operations — roughing, tapping, boring, finishing— without time loss for tool changes.



SPECIALTIES LATHE STOP

Eliminates repeated measuring . . . speeds up production. You measure only once for each operation. Once the four measuring positions are set, you just index.



CONVERT YOUR ENGINE LATHE INTO A TURRET LATHE

Any lathe can be converted into a complete, accurate, precision turret lathe in *minutes* with these SPECIALTIES lathe accessories. Attached to your engine lathe, the SPECIALTIES Cross-Slide Turret, Tail-Stock Turret and Lathe Stop permit you to do any kind of work—forming, roughing, boring, finishing, tapping—without stopping the lathe or changing tools.

Mail the coupon for complete information about this SPECIALTIES production team designed to help you increase the capacity of your lathe and cut machining costs.

SPECIALTIES Manufacturing Co., Inc.
40 Farrand Street, Bloomfield, N. J.

Please send me full information on SPECIALTIES lathe accessories.

Name_____

Company_____

Address_____

City_____ State_____

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MANUFACTURING COMPANY, Inc.

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have landed . . .

Mr. Business Executive, you are a four-star general when this war ends. It is up to you to have the jobs for our boys, then. They have fought and will have won this war . . . but with "cease firing" they will look to you for their peacetime commands. Will you be ready? Is your plant and your sales organization ready to absorb the shock of rightful invasion by the returning hordes of Americans? Nine million American men and women returning to the civilian way of life! Think ahead, Mr. Business Executive, to the time when you again will have to make the decisions and give the orders. When the sales battle is once again how to whip competition. When markets are measured in customers rather than in government contracts. When production at any cost becomes production at lowest cost. To turn a profit, then, we suggest you turn to LeBlond now . . . it's time to retool for "peacework".

THE R.K. LeBLOND MACHINE TOOL CO., CINCINNATI, 8

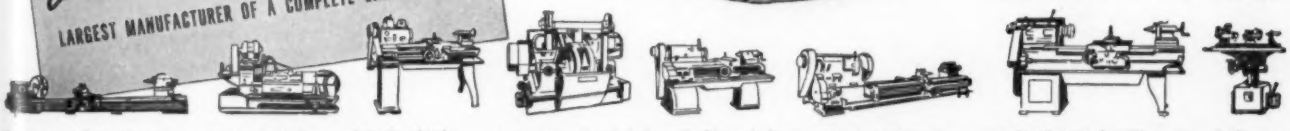
NEW YORK 13, 103 Lafayette St. CAnal 6-5281

CHICAGO 6, 20 N. Wacker Dr. STA 5561

time to retool

Turn to Le Blond for Turning Equipment

LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES



HD Engine Lathes—Nine sizes ranging from 12" to 50" swings. For versatility in turning

Automatic Lathes—12" & 16" Mechanical or Hydraulic power

Super Regal Lathes—Six sizes, 13" to 24" Best for training

Automatic Crankshaft Lathes—For all facing, turning, finishing, pins

Tool Room Lathes—12", 14", 16" and 18" swings. Versatile

HD Gap Lathes—Ten sizes in Regular and Sliding Gap models

Rapid Production Lathes—13", 17", 20" swings. Six speeds. Faster output. Lower cost.

No. 2 Cutter Grinder—Internal, cylindrical, face and angular work.

Check-Clip-Mail

FOR ILLUSTRATED SPECIFICATIONS:

- ☐ HEAVY DUTY GEARED HEAD ENGINE LATHES
- ☐ TOOL ROOM LATHES
- ☐ AUTOMATIC LATHES
- ☐ HEAVY DUTY GEARED HEAD GAP LATHES
- ☐ SUPER REGAL GEARED HEAD LATHES
- ☐ RAPID PRODUCTION LATHES
- ☐ AUTOMATIC CRANKSHAFT LATHES
- ☐ No. 2 CUTTER GRINDER

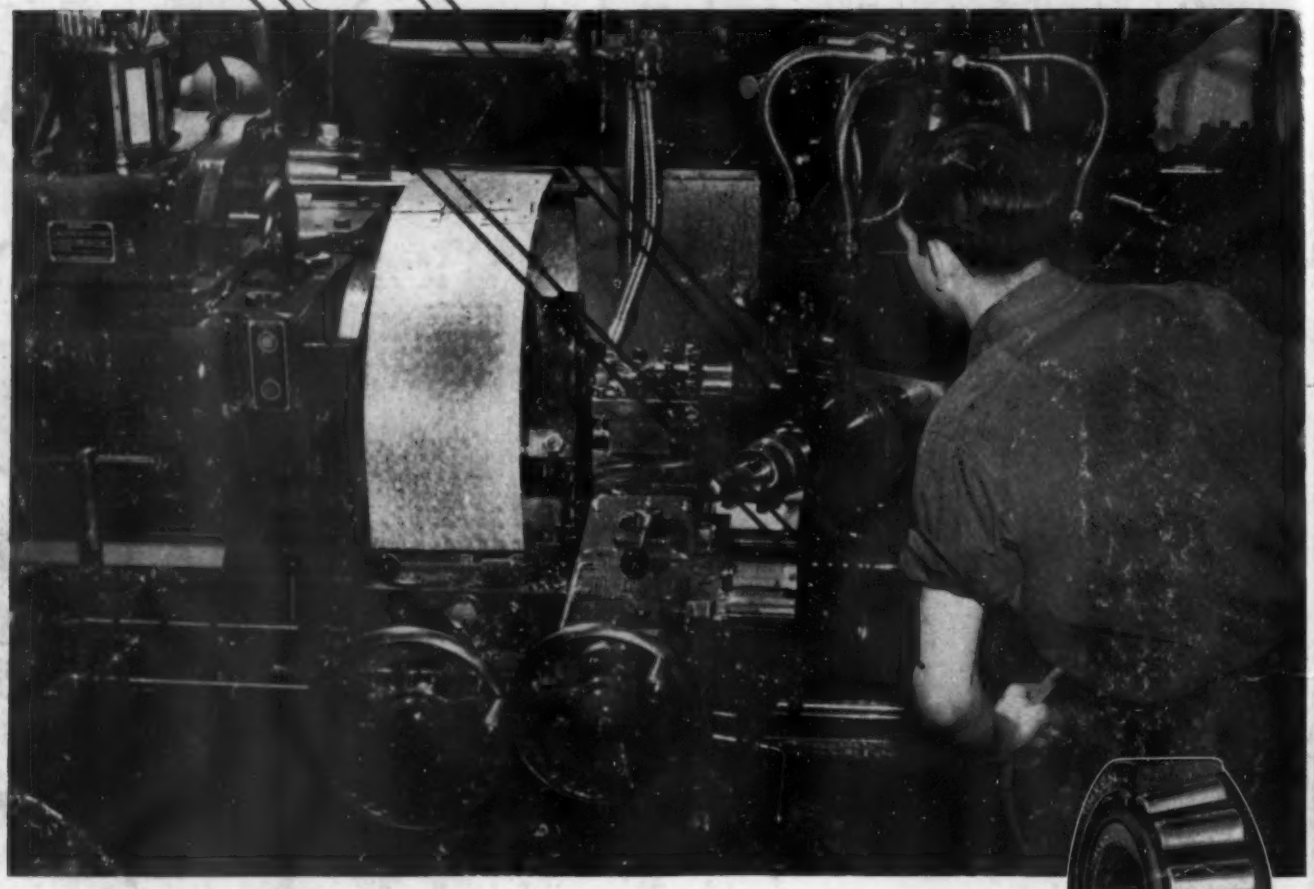
YOUR NAME _____ TITLE _____

YOUR FIRM _____ ADDRESS _____

YOUR BONDS BUY BOMBS

BUY A "BLOCK-BUSTER" TODAY!

Helping to keep American machine guns strafing . . .



Warner & Swasey No. 2-A Turret Lathe equipped with Timken Bearings making trunnion adapters for 50 caliber machine guns.

Machine guns that fire 750 rounds a minute —the guns that spit death and destruction from the wing ports of American fighter planes and the turrets of bombers—rival the finest watch-making in precision.

Every part must fit its position with split-hair exactness and all parts must be freely interchangeable without affecting accuracy of performance in the slightest degree.

In the machines that make these parts—like the Warner & Swasey No. 2-A Turret Lathe shown in the photograph—Timken Tapered Roller Bearings are used on the spindles and at other vital positions to assure the extreme and lasting precision necessary for such close tolerance work. Be sure your new machines have them; most makes do. The Timken Roller Bearing Company, Canton, Ohio.

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TAPERED ROLLER BEARINGS